Defense AT&L

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Taking DoD Contracting From Good to Great

Defense AT&L interviews Charlie Williams

Director, Defense Contract Management Agency



ALSO

Knowledge vs. Experience

Sharpening the Spear Through Innovative Acquisition

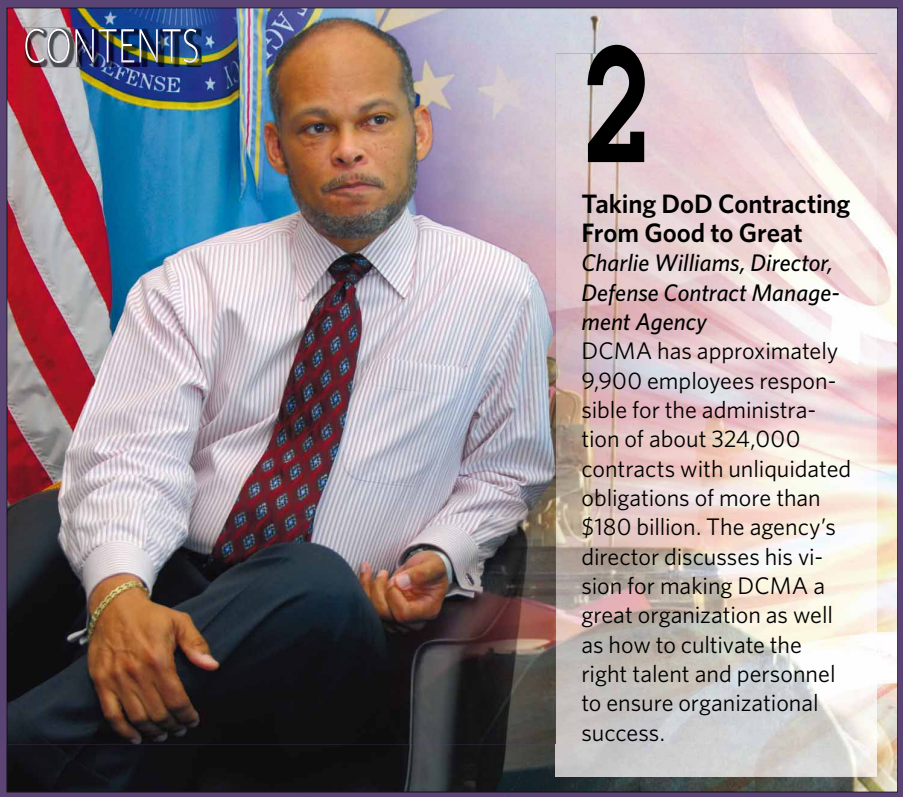
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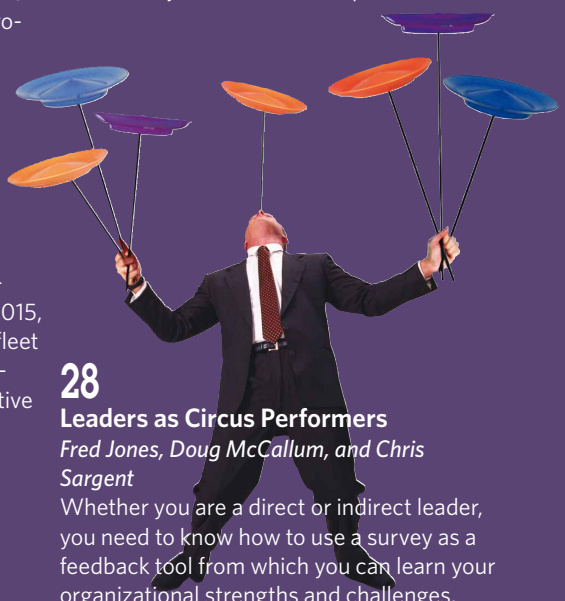


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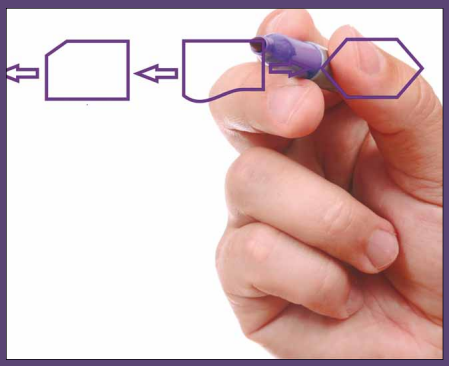


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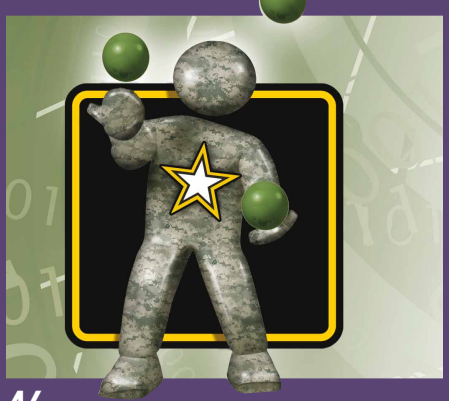
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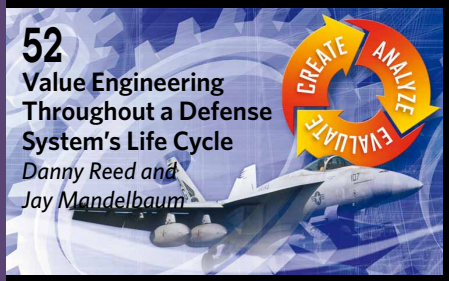


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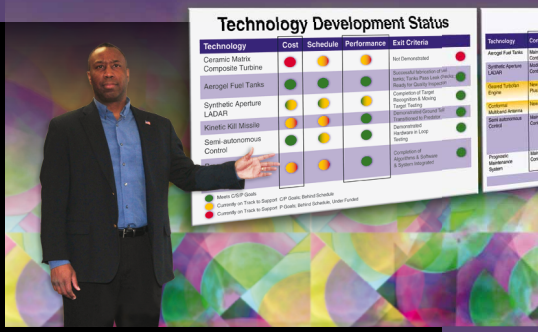


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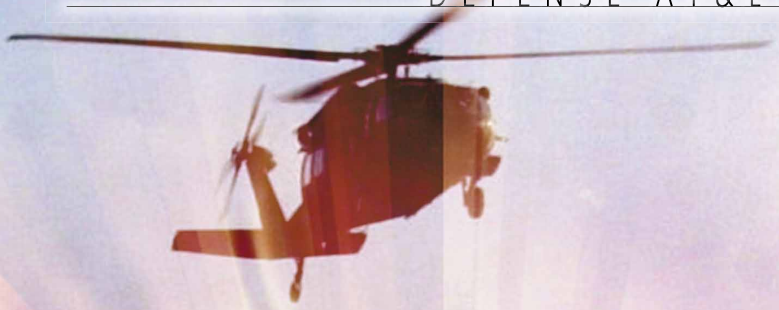
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You need to look only as far as the evening news to see that giants of industry are struggling to stay profitable, maintain or improve market share, and remain viable for the future. These giants, as well as the little guys, have realized they are not in it alone.



Taking DoD Contracting From Good to Great

Charlie E. Williams Jr., Director,
Defense Contract Management Agency

Charlie E. Williams Jr., who became the director of the Defense Contract Management Agency on May 4, 2008, oversees an organization composed of approximately 9,900 professional civilian and military employees located at more than 700 locations around the world. DCMA is responsible for the administration of about 324,000 contracts with unliquidated obligations of more than $180 billion awarded to more than 17,000 contractors. DCMA accepts approximately 750,000 shipments of supplies and some 1,200 aircraft each year in addition to managing over $100 billion of government property and administering about $32 billion of contract financial payments each year.

In February, Williams took the time to discuss his vision for making DCMA a great organization, how to cultivate the right talent and personnel to ensure organizational success, and other topics. Air Force Maj. Michelle Brunswick, DAU professor of acquisition management; James P. McNulty, DAU professor of systems acquisition management; and Denise M. Wheaton, DAU professor of acquisition management provided consulting services on the development of this interview.



DCMA provides direct support to operations in Iraq. From left to right are Col. Frank Steinbugl, director, Combat Support Center; Charlie Williams, DCMA director; Capt. David Graff, director, DCMA International Division; Lt. Kelley Thompson, operations officer, DCMA Iraq/Afghanistan; and Lt. Col. Lance Green, DCMA executive officer.

Q

When you took the reigns at DCMA, you spoke about taking the agency from good to great. From your perspective, what are some hallmarks of a great organization?

A

Jim Collins, the author of *Built to Last*, has recently written a book entitled *Good to Great: Why Some Companies Make the Leap ... and Others Don't*. In his first book [*Built to Last*], Collins wrote a management study of how great companies triumphed over time and how they engineered long-term sustained performance into the DNA of an enterprise from the very beginning. In his follow-up book, [*Good to Great*] Collins answers the question, "What about the company that is *not* born with great DNA?" Is it possible for good companies, mediocre companies, even bad companies to achieve enduring greatness?

Collins and his research team identified a set of companies that became great and sustained their greatness over at least 15 years. He then set about trying to determine what it was about 28 such companies that made the leap to greatness and were able to sustain it for a long period.

To put it succinctly, Collins determined that there were five findings common to all of the great companies:

- Level 5 Leaders—Leaders who channel their ego needs away from themselves and into the larger goal of building a great company. It is not that Level 5 leaders have no ego or self-interest. Indeed, they are incredibly ambitious—but their ambition is first for the institution, not themselves.
- The Hedgehog Concept—Transcending the "curse of competence."
- A Culture of Discipline—Combining a culture of discipline with an ethic of entrepreneurship can produce great results.
- Technology Accelerators—Good to great companies think differently about the role of technology.
- The Flywheel and the Doom Loop—Those who launch radical change programs and wrenching restructurings usually fail to make the leap to greatness.

Leaders who took their companies to greatness first got the right people on the bus, the wrong people off the bus, and the right people in the right seats—and then they figured out where to drive it. The old adage "People are your most important asset" is not exactly true. The right people are.

Therefore, I see my first challenge as cultivating Level 5 leadership in DCMA. I believe that potential Level 5 leaders exist

all around us if we just know what to look for, and that many people have the potential to evolve into Level 5 leaders.

It is my goal to take DCMA to the next level, all the while pursuing greatness. Our Human Capital Solutions Initiative is an important piece of getting the right people on the bus and getting them the right training to put them in the right seats. We are trying to ensure that we are growing the individuals who can become the Level 5 leaders the agency will require for the future.

Q
Can you describe how program managers can better leverage DCMA resources to keep programs on budget and within schedule constraints?

A
Developing solid lines of communications between program offices and DCMA offices is, without question, the most critical element of program support and success. While DCMA provides oversight of contractor processes, we are constrained as to the depth of that oversight by resources. Therefore, knowing what is important—those high-risk elements—in a program helps DCMA focus its limited resources on influencing contractors appropriately. Such knowledge and understanding come only from the program managers' having solid lines of communication between the program office and the appropriate DCMA offices.

For "cost plus" programs with earned value reporting requirements, DCMA provides an independent EAC [*estimate at completion*] to the program manager. DCMA's unique perspective allows adjustments to a specific contract's performance based on performance of the contractor across the company. That is a perspective program managers can get from no other source. They can use the information to take specific contract actions, giving a program a better chance of early intervention and avoidance of potential budget and schedule issues.

Q
I understand DCMA is establishing a supply chain management center of excellence. How does supply chain management tie in with contract administration in accordance with the Federal Acquisition Regulation (FAR)?

A
Well, first, I like to think of it as supply chain predictability as opposed to management. We're interested in exploiting our unique positioning with industry to provide the defense enterprise with predictive decision-quality information across the supply chain. I wouldn't call this supply chain management.

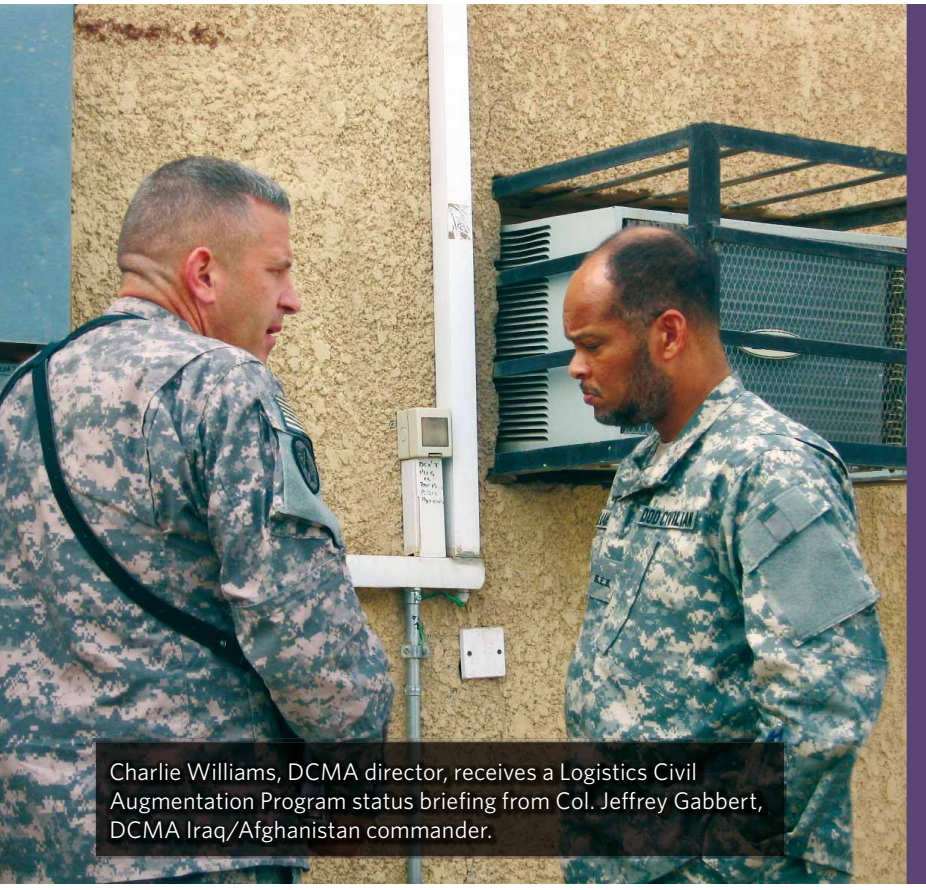
One of the key tenets of supply chain predictability is the ability of the system to capture key metrics from the lower functional levels of the business and pull them upward. When we talk about key metrics in the supply chain arena, we must consider more than just functionally relevant indicators. That is, metrics like procurement, warehousing and inventory, design engineering, master production, etc., should not just be used to establish a performance plan. To be meaningful and allow visibility to the enterprise-level goals, the indicators must transgress their functional area and provide an unbiased view of attainment to plan at the corporate level. In other words, I do not reduce the per-item cost of tires by increasing tire-production volume beyond the number of cars in the master schedule. Supply chain metrics prevent a particular functional area from looking good at the expense of the enterprise.

Q
How does all this relate to DCMA and the FAR/Defense Federal Acquisition Regulation Supplement (DFARS)?

A
DCMA, as the federal entity responsible for contract management—and in particular, oversight within the constraints of cost, schedule, and technical requirements—relies heavily on the direction that comes from the FAR/DFARS. Several sections come immediately to mind, but let us discuss just two: FAR 42.302, "Contract Administration;" and DFARS 252.242-7004, "Material Management and Accounting System."

Specifically, FAR 42.302(a) (31) requires us to perform production support, surveillance, and status reporting, including timely reporting of potential and actual slippages in contract delivery schedules. Section 40 provides direction regarding performance of engineering surveillance to assess compliance with contractual terms for schedule, cost, and technical performance in the areas of design, development, and production. Section 41 requires an evaluation for adequacy and performance surveillance of contractor engineering efforts and management systems relating to design, development, production, engineering changes, subcontractors, tests, management of engineering resources, reliability and maintainability, data control systems, configuration management, and independent research and development.

FAR 42.11, "Production Surveillance and Report," requires "Government review and analysis of contractor performance plans, schedule, controls, and industrial processes; and the contractor's actual performance under them." FAR 42.1103 states, "The contractor is responsible for timely contract performance. The Government will maintain surveillance of contractor performance as necessary to protect its interests." DFARS subpart 242.11 requires surveillance, which must address risk. DFARS 252.242.7004 speaks to the requirements for the material management and accounting system. This section of the DFARS requires the supplier to maintain adequate internal controls to ensure system and data integrity, including documented policy, procedures, and operating instructions; forecast-



Charlie Williams, DCMA director, receives a Logistics Civil Augmentation Program status briefing from Col. Jeffrey Gabbert, DCMA Iraq/Afghanistan commander.

Those who are succeeding realize that their survival—today and tomorrow—depends upon establishing and executing strategic relationships with their folks up and down the supply chain, and by leveraging information technology.

ing of material requirements; bill of material accuracy (98 percent or greater); master schedule accuracy (95 percent or greater); and inventory accuracy (95 percent or greater).

Oversight of key systems and processes along with the collection of key performance metrics are part of an integrated surveillance strategy providing the DCMA customer with the predictive insights needed to understand the cost, schedule, and technical dynamics of product development.

Q
Another DCMA initiative is to integrate the principles of Lean Six Sigma (LSS) into your operational regimen to improve efficiency and effectiveness. How do you see this effort proceeding? What kinds of cultural changes are necessary within DCMA to facilitate this approach?

A
DCMA recently gave our Continuous Process Improvement Program Office a new focus and direction. The CPI Program Office will oversee and manage a system for capturing and documenting process performance improvements. This ensures DCMA has a disciplined management approach for improving processes and procedures to drive a consistent and verifiable process management program.

LSS is an essential tool for improving operational effectiveness and efficiency. The CPI Program Office will systematically determine which LSS projects best benefit the agency using performance process information. We will use LSS to produce stable and predictable results for application to DCMA's strategic priorities.

DCMA has been on the performance management road for several years, and employing LSS will not require a major cultural change. DCMA has many LSS projects in development. LSS project development adds one more tool as we continue our journey of performance management.

Q
Over the past few years, DCMA has been implementing a significant change in perspective to a customer-focused culture, becoming an organization that focuses on customer-desired outcomes. Have you observed, in your own experience, this shift in focus? How do you see it improving customer satisfaction in DCMA?

A
Our overarching performance management system aligns our vision, mission, and strategic plan with the requirements of the DoD acquisition enterprise and its partners. The customer-focused culture is another critical piece of our performance management development. DCMA has always been a champion of its customers. That cultural focus has given us stronger ties to our customers and provided clear roles and responsibilities, improving our customer engagement

at the program management and program executive office levels. The focus on customer-desired outcomes has led to a concentration on results and an alignment with the customers' goals and outcomes. We have seen that the increased emphasis on this alignment has resulted in an even better understanding of supplier processes and adjustments to our strategies to influence changes in suppliers' performance.

Our next step in performance management will integrate our strategic planning and performance-management assessment functions. This integration will result in consistent, verifiable processes and establish controls to support our DoD acquisition enterprise and its partners. As we discussed, this may lead to LSS projects, information technology business process re-engineering projects, or increased customer focus. The overall outcome will be better DCMA performance.

Q

You have a number of agency people deployed. Over the past few years, the need for volunteer civilian personnel performing contracting, quality assurance, and other duties in-theater has grown, and demand is likely to continue. DCMA provided another 100 volunteers at the end of 2007 to support missions in Iraq and Afghanistan. Would you talk about the support those civilian volunteers provide? How do you recruit for such positions? How do you manage the workload left behind by these volunteers when they deploy? Is it possible to integrate these growing theater responsibilities into your normal mission routine?

A

Our DCMA civilian volunteers stepped up in the time of need and have performed superbly. Civilians represent more than half of our deployed workforce, and we could not accomplish our mission without them. Their willingness to deploy allowed our agency time to grow and leverage our Emergency and Essential (EE) Program—a pool of acquisition professionals hired specifically to support DCMA's contingency contract administration mission.

Last fall, the agency implemented a robust public affairs campaign and a strategic communications plan to articulate our urgent need for volunteers to meet a rapidly increasing workload in Iraq, Afghanistan, and Kuwait. The agency established a Web-based volunteer application process that allows any agency employee to submit an application to deploy.

Recruiting for EE positions is a little different. We globally advertised for specific skills and positions we competitively awarded based upon qualifications and experience. EE employees enter a three-year program with the understanding they will deploy a minimum of 365 days during the program. In both approaches, we maximized the Office of Personnel Management recruiting incentives and other initiatives to compensate personnel willing to deploy. Our

Charlie E. Williams Jr.

Director, Defense Contract Management Agency

Charlie Williams was appointed as Defense Contract Management Agency's new director by John J. Young Jr., under secretary of defense for acquisition, technology and logistics, on May 4, 2008.



Prior to assuming his new duties, Williams was the deputy assistant secretary of the Air Force for contracting in the Office of the Assistant Secretary of the Air Force for Acquisition; and the U.S. member of the North Atlantic Treaty Organization's Airborne Early Warning and Control Programme Board of Directors. Williams served as the associate deputy assistant director for contracting in the Office of the Assistant Secretary of the Air Force from March 2002 to 2003. He has also served as the team lead, program executive officer, and designated acquisition commander programs for the deputy assistant secretary for contracting, Office of the Assistant Secretary of the Air Force for Acquisition.

Williams entered federal service in 1982 through the Air Force Logistics Command's Mid-Level Management Training Program, Kelly Air Force Base, Texas. Upon graduation, he served as senior buyer and contracting officer for F100 and TF39 engines at Kelly. From 1984 to 1987, Williams was a procurement analyst in the Resources and Analysis Division of the Headquarters Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.

Williams participated in the Air Force's prestigious Education with Industry program for a year, working at GE's Aircraft Engines Division, Cincinnati, Ohio, from June 1987 until July 1988. Following this year of duty in the private sector, he became the director of business strategy in the Acquisition Logistics Division at Wright-Patterson.

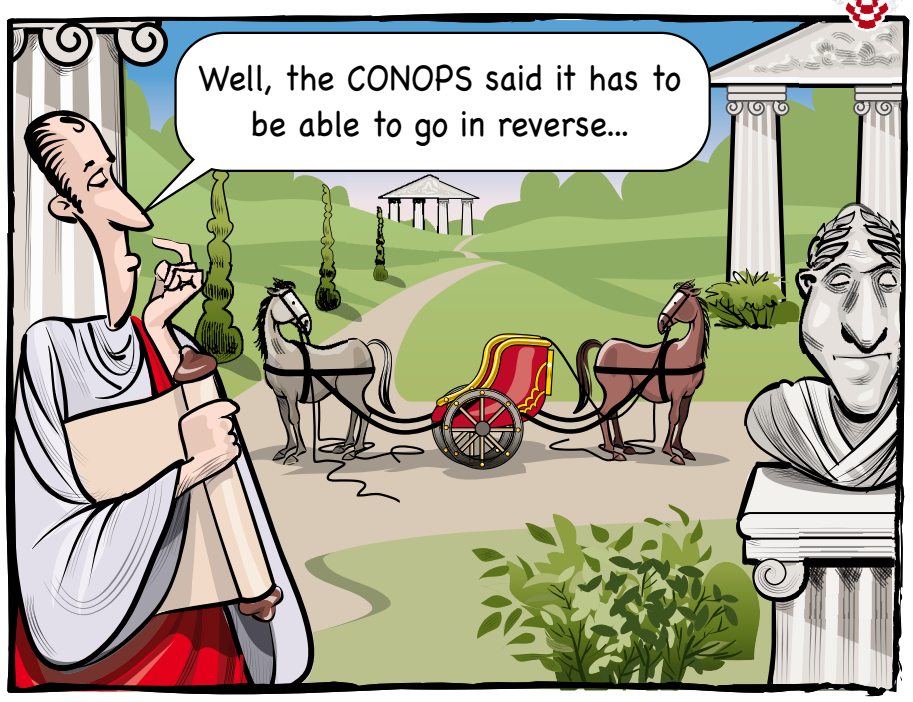
Williams is a member of the Defense Acquisition Corps and is Level II certified in systems acquisition. He holds a bachelor's degree from Middle Tennessee State University, and a master's degree from Tennessee State University. He is also a 1996 graduate of the Industrial College of the Armed Forces, where he earned a second master's degree.

His awards and recognitions include a special service award, the Meritorious Civilian Service Award, the Exceptional Civilian Service Award, and the Meritorious Executive Presidential Rank Award.

13 THETA

By Dan Ward, Chris Quaid, Gabe Mounce, and Jim Elmore

GREAT MOMENTS IN ACQUISITION HISTORY



100 BC: Roman chariot technologists discover the importance of writing good requirements.

pool of talent has certainly grown, but we will continue to recruit volunteers and EEs to ensure we can meet the demands of tomorrow.

There has been a definite impact to our acquisition life cycle management mission. The unsung heroes are the dedicated professionals who developed innovative approaches to mitigate risk and maintain effective contract management support in a resource-constrained environment. Our product divisions continually meet in "war room" sessions to develop enterprise solutions, cross-leveling and managing resources across geographic and programmatic boundaries. The agency employs a structured approach to balancing the most critical workload, whereby the agency's contract management offices identify resource capacities and determine the gaps and associated impact, and develop creative resourcing solutions to close those gaps.

Iraq, Afghanistan, and Kuwait remain contingency environments, so we will continue to resource our mission with military and civilians performing 179-day assignments. If, at some point, the department declares those locations are no longer contingency environments, we will likely absorb the mission into our DCMA International Office, which provides worldwide contract administration support.

Q

To meet urgent needs, the Department of Defense can issue undefinitized contract actions (UCA), which authorize contractors to begin work before reaching a final agreement on contract terms. Can you explain how UCAs differ from traditional contracting methods, and when they are used? What benefit might they offer, and what problems might they pose?

A

UCAs are a valuable tool for meeting urgent contract requirements. However, they are not a desirable form of contracting because the government bears the majority of the cost and risk during the undefinitized period. In addition, the government risks paying increased costs because contractors have little incentive to control costs before definitization. For these and other reasons, the department is working to ensure we use UCAs appropriately and with sufficient management oversight to mitigate the increased risks.

Q

Getting the correct people in the correct positions is of paramount importance, especially with the looming specter of a workforce shortage as a result of impending retirements. Given that, it is not surprising that you have made human capital one of your top priorities. How are you designing a system that hires and keeps the right people?

A

Obviously, in any organization, employees are fundamental to accomplishing the mission. At DCMA, we realize that to sustain a "best-in-class" workforce for the future, we need to look at not only the programs offered to our employees, but also what kind of a culture is needed to foster an employee-friendly environment.

Our human capital staff members have been diligently working on creating an updated Strategic Human Capital Plan focused on creating a vision for our workforce of the future. We are focusing on identifying our true brand identity and

employment value proposition at DCMA. Working with the Office of Personnel and Management and some support contractors, DCMA plans to unveil a new recruitment and branding solution, complete with a more user-friendly, robust recruiting Web page, as we look to attract employees at all skill levels, from interns to seasoned, highly experienced professionals.

Our human capital efforts have also focused on building and managing an acquisition workforce that can meet current and future needs. We must take maximum advantage of new programs such as the Acquisition Workforce Development Fund initiative, which gives us a means to increase hiring for interns and advanced journeymen; and use recruiting, relocation, and retention incentives to help us attract and retain critical skills across the enterprise. The Human Capital Division is helping our leaders utilize all of those flexibilities available to attract high-quality employees to DCMA. We are becoming a competency-based organization, using competency models within our critical occupational series to identify competency gaps and determine remediation strategies to close those gaps as we prepare our workforce for the future.

Last, but not least, included within our human resources strategy will be an agency diversity and inclusion strategy. As we grow our workforce, we will do so with an appreciation of the nation's diversity to ensure we take advantage of the talent the nation has to offer.

Q

DoD created the Acquisition Workforce Development Fund (Section 852 of the National Defense Authorization Act for fiscal year 2008) to reconcile some of the imbalances in the current workforce. Can you describe how DCMA will use these funds to attract and retain the right workforce?

While we will use the workforce development funds for training and incentives, the bulk of the funds will be used for re-growing the workforce.

DCMA assessed the current skills and competencies possessed by the agency as well as future requirements identified by our customers to determine the agency's personnel shortfalls. In addition, we projected our personnel losses to include retirements, given that the average age of the DCMA employee is 52. Using the funds provided by the Acquisition Workforce Development Fund, DCMA will seek to hire interns and journeymen. We announce positions through USAJOBS, participate in career and job fairs on college campuses and with industry-specific organizations, and recruit at military transition centers. We have also recently collaborated with the Federal Acquisition Intern Coalition to improve the hiring process of 1102s by streamlining job announcements, rewriting the Administrative Careers with America examination to focus on competencies, and using an interactive Web site to solicit applications. The first job announcement yielded more than 4,000 applications, and DCMA is working closely with the coalition to select as many as 300 individuals from the candidate list.

One of the critical skills areas we will focus on is pricing. We need to help the department reestablish critical cost-pricing skills that have atrophied over the years. To the extent that DCMA can help contracting officers in pre-award negotiations, we want to do so.

Q

DCMA headquarters will experience a major geographical change as a result of a 2005 Base Realignment and Closure decision to relocate your organization from Fort Belvoir, Va., to Fort Lee, Va. How are you working to ensure a smooth turnover and continuation of operations? What are some of the biggest challenges associated with this kind of major change?

A

The upcoming BRAC move is not just the physical relocation of an organization. It also represents a significant personal event for the workforce and families that will elect to relocate to Fort Lee, as well as those that elect to stay behind. We must ensure we remain cognizant of the impact that BRAC will have on everyone affected. This presents a tremendous challenge, given we must also maintain our continuity of operations during this transition period.

As an agency, we must decide what the appropriate organization structure and alignment will be for the agency elements moving to Fort Lee. That will largely drive the human capital and transition strategies that should ensure we have the right people, skills, and capabilities to maintain operations. Our BRAC transition plan is nearing completion, and it will guide us through the transition period.

We do anticipate that a significant portion of our workforce will choose not to move. The current economic climate related to housing will have an impact, as will our communication strategy aimed at to ensuring employees understand the many positive opportunities the move will present. We are doing everything we can to encourage employees to relocate and are beginning to recruit the right skills now for Fort Lee.

We will continue to use seminars, all hands sessions, brown bag lunches, and other means to help our people make informed decisions. We will also have information sessions and a continuous dialogue with representatives from Fort Lee, the Petersburg and Richmond local communities, local housing, and medical and education institutions. Our employees are critical to the success of this move, and we are committed to them as we begin this transition.

Q

Mr. Williams, we thank you for your time.



Knowledge vs. Experience

The Need for an Acquisition On-the-Job Qualification Standard

Roy Wood

The admiral's letter attached to the transfer orders read, "Congratulations, Cmdr. Smith! You have been accepted into the aviation community and will be given the opportunity to fly our newest and most sophisticated aircraft. As a mid-career officer, you have proven yourself in your warfare specialty and have been a successful leader. You are clearly ready for a new challenge."

Over the next several weeks, Smith was immersed in classroom lectures on complex flight systems and aircraft operations. There were viewgraphs, of course, and even a few group exercises in which each officer in the class assumed the roles of the various crew members to get a feel for how they should work together during a mission. The capstone week included a series of case studies, mainly focused on what to do when things invariably went wrong. That led to lengthy discussions, but the students were warned that every problem was, in its own way, unique and had to be handled through application of good leadership and communications. Finally, it was graduation day, and Smith was taken out to the hanger, shown the aircraft she'd be flying, and introduced to the crew (most of whom had been similarly trained).

"It's time now," the instructor said. "You are all successful graduates of the training class, and Cmdr. Smith is a proven leader. Your aircraft is ready, the crew is assembled, and you have been briefed on your mission requirements. It is all up to you now. Climb aboard and take command. Good luck and godspeed!"

Wood *is the dean of the Defense Systems Management College at the Defense Acquisition University. He has 28 years of experience in defense acquisition, and has previously served as the principal assistant deputy under secretary of defense for international technology and security.*

Knowledge vs. Experience

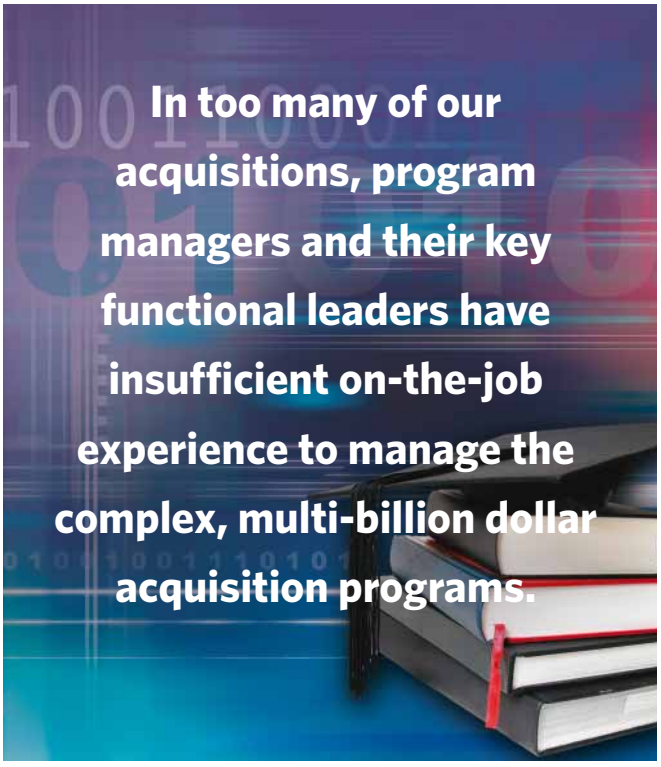
That scenario, of course, is a recipe for disaster. U.S. military services would never consider letting someone—especially an officer with experience in a vastly different field—fly a complex aircraft with only a few weeks of classroom indoctrination. Why? Because we all recognize the difference between knowledge and experience. Yet in too many of our acquisitions, program managers and their key functional leaders have insufficient on-the-job experience to manage the complex, multi-billion-dollar acquisition programs. Even the acquisition professionals who are lucky enough to have served in program offices throughout much of their careers may have experience that is too narrowly focused to handle the breadth of challenges presented by today's complex acquisition processes. But how could this happen?

In general, there are three components of the certification process: education, training, and experience. The education requirement is reasonably straightforward and easily verified. Training requirements are similarly straightforward, requiring the workforce to attend a specified series of courses at the Defense Acquisition University or obtain equivalent training. The weak link is the experience requirement. In most cases, the experience requirement is simply to have a minimum number of years in an acquisition-related job or jobs. The jobs that are considered acquisition-related are not specified, and there are no standards for the quality of the on-the-job training or experience. At best, the vague experience requirements render any certification questionable. At worst, the requirement becomes meaningless.

So why is this important? Just as with the example of the inexperienced aircraft pilot, no amount of training without significant quality experience can prepare an officer or civilian to be successful in today's complex defense acquisition environment. With billions of dollars at stake, we can ill afford to "crash" a major acquisition program any more than we can crash an expensive new aircraft. And just as it takes time in the cockpit with an experienced instructor pilot to fly a modern aircraft, acquisition leaders need focused on-the-job experience in the program office with skilled mentors to learn to manage their complicated programs.

Managing Complex Defense Acquisition Programs

Acquisition programs are exquisitely complex—far more so than most people realize, particularly those who have never been assigned to a program office. Planning, adjusting, and replanning occur frequently. Technical decisions and tradeoffs are made throughout the life of the program, requiring a detailed knowledge of the science and engineering behind the hardware and software. Budgets can fluctuate with every annual appropriation bill, and program costs and schedules can change when problems are encountered or requirements change. Program managers must have the experience to be able to react to any changes quickly and correctly to prevent small perturbations from crashing their program.



On any given day, dozens of critical decisions are required that may have far-reaching consequences for program cost, schedule, system performance, contractual obligations, or even team morale. It requires experience and wisdom to foresee the consequences of many alternative courses of action and make the right decisions.

An Acquisition Qualification Standard

Fortunately, the solution to the experience challenge is reasonably straightforward and can be modeled after existing qualification systems in the military services. The acquisition community should adopt its own version of the Navy's personnel qualification standards or the Air Force's career field education and training plan. Those systems are standards-based and aligned to core competencies required for complex tasks. Both contain training and experience components. For the Navy, comprehensive personnel qualification standards are in place to support enlisted- through officer-level qualifications for a wide variety of watch stations, tasks, and warfare qualifications. The Air Force plan is already tailored to acquisition program managers.

Using a written acquisition qualification standard (AQS), individuals would work toward formal job qualification, demonstrating their knowledge, skills, and abilities to perform the tasks at their certification level in their chosen career field. Each knowledge or skill requirement would be demonstrated to their supervisors or other qualified individual(s) authorized by the commander or supervisor to certify others in the task or skill. Each competency would be certified by initials or signatures of both the individual and supervisor in order to be satisfactorily certified. Once all the individual competen-

cies are completed, the candidate may be required to further pass a comprehensive written or oral exam administered at the command or component level, or perform the entire task set under supervision to demonstrate that the individual is ready to "fly solo."

An AQS system would be a boon to the acquisition community. Formal competencies and personnel qualification standards should be derived for each career field (e.g., contracting, systems engineering, program management, etc.) at each certification level (I through III). Written qualification guides should be developed for use by every acquisition professional aspiring for a career field/level designation that includes a breakdown of competencies and recommended demonstration methods (Q&A, demonstration, etc.). Individuals would be required to attend the prerequisite training, as they currently do, and then be issued a certification AQS workbook for on-the-job completion. When all items in the booklet are completed, the individual's supervisor would decide whether an examination or demonstration would be required to be recommended for certification.

AQS: An Example

Using another example with the fictional Cmdr. Smith, say the commander desires to be certified as a Level III program manager. The certification requires that Smith be previously certified at Level II as well as attend functional training online and at a regional DAU campus. After Smith completes the courses, she will be given an AQS booklet that lists perhaps 50 tasks that she must perform satisfactorily in order to demonstrate her ability to be certified at Level III. Some examples of potential tasks:

- Prepare for and participate in a significant program review (preliminary design review, critical design review, or program milestone)
- Participate in an integrated baseline review to document a contract baseline
- Lead a budget-related "what-if" drill on a program and prepare a report of impacts to senior leadership.



The first AQS item would ensure that Smith had a working knowledge of the systems engineering and decision-gate processes for her program. The second AQS objective would focus Smith's efforts on understanding the program contract, work-breakdown structure, and cost account management. The third would provide practical experience in the analytical skills required to understand potential budget risks and impacts, mitigate risk, and communicate important program information to Smith's leadership. Those activities would be assigned and evaluated by an experienced program manager, who would also provide valuable feedback and likely share his or her real-world experiences with Smith (creating a positive mentoring relationship).

This level of rigor in the proposed AQS certification process would create an environment in which action learning—studying your own actions to learn how to improve one's performance—takes place on the job. Using the AQS system, individuals will not only hear about acquisition competencies in the classroom, but will experience them in the workplace. The system will provide a definitive roadmap for every acquisition professional, with a set of prescribed tasks and activities needed to build confidence and competence. It will also be a way supervisors can measure when their subordinates have the requisite training and experience to do the job, and can be made an integral part of their NSPS [*National Security Personnel System*] or other performance evaluation goals and objectives.

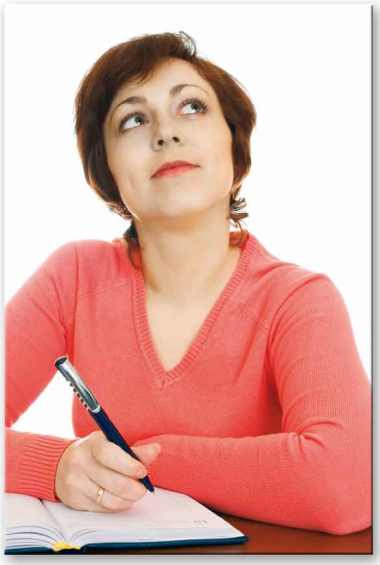
Beyond Formal Training

Managing a complex defense program is hard work and requires training and experience to be successful. Formal training courses are excellent and provide a good foundation of knowledge for acquisition professionals. Formal training alone, however, is inadequate. A robust AQS program, coupled with foundational training, would provide a better-prepared cadre of capable, experienced professionals. The rigor of an AQS program would require individuals to demonstrate their understanding and ability to perform key tasks before being certified in a career field at a specific level. This rigor would give personnel specialists, program executive officers, and other executive decision makers a greater confidence that personnel who were certified have demonstrated their ability to do the basic functions of the jobs. That would result in better assignments of more qualified personnel and decrease the chances of an inexperienced acquisition professional "crashing" his or her program.

The author welcomes comments and questions and can be contacted at roy.wood@dau.mil.

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Sharpening the Spear Through Innovative Acquisition

The F-5 Adversary Program

Jay Bolles ■ William Broadus ■ William F. Conroy III ■ Lt. Cmdr. Jason Goff, USN ■ Mike Ingalls ■ Mike Kotzian ■ Duane Mallicoat ■ Capt. James Wallace, USN

Today's naval aviators feel confident their tactics and training were instrumental in accomplishing the successful missions conducted during Operation Enduring Freedom and Operation Iraqi Freedom. In typical fashion, lessons learned will be documented and studied, then applied toward the development of new tactics and training procedures. Key to the development of lessons learned will be the Adversary Program that prepares Navy and Marine Corps pilots for the combat environment of the future. Air combat expertise that was vital to yesterday's operations will not necessarily be effective in tomorrow's conflicts. As one means to ensure naval aviators remain ahead of the curve in terms of air combat expertise, the Adversary Program provides fleet fighter pilots with real-world airborne engagements that replicate validated threat tactics in the most credible manner possible. For that reason, the Adversary Program must use the best representative equipment available in the most realistic environment possible to ensure U.S. aviators continue to excel at their missions.

Bolles *is the Adversary Program integrated product team lead for PMA 207.* **Broadus** *is a DAU professor of systems engineering and acquisition management.* **Conroy** *is a DAU professor of life cycle logistics and production, quality, and manufacturing.* **Goff** *is the Adversary Program deputy program manager for PMA 207.* **Ingalls** *is a program manager for Northrop Grumman.* **Kotzian** *is a DAU professor of acquisition management.* **Mallicoat** *is a DAU professor of life cycle logistics and acquisition management.* **Wallace** *is the program manager for PMA 207.*

"A common adage within the strike/fighter community is 'you're only as good as you train.' The Navy and Marine Corps' Adversary Program directly enables that training at multiple levels through cost-effective, realistic, and tailored adversary support designed to accurately mimic potential future adversaries," said Lt. Cmdr. Mark Sucato, an Adversary Program requirements officer.

A Requirement to Change

The F-5 aircraft serves as the primary Adversary Program platform for the U.S. Navy and the Marine Corps. The aircraft is a single-seat, twin-engine, tactical fighter/attack platform. Using a design that emphasizes high maneuverability rather than high speed, the F-5 is ideally suited as an adversarial air-to-air threat that replicates other foreign military capabilities.

Currently, there are two Navy adversary squadrons that maintain and operate F-5 aircraft: the VFC-13 "Fighting Saints" at Naval Air Station Fallon, Nev., and the VFC-111 "Sundowners" at Naval Air Station Key West, Fla. A third squadron operated by the Marine Corps is the VMFT-401 "Snipers," and it is located at Marine Corps Air Station Yuma, Ariz. The squadrons' mission is to engage Navy and Marine Corps aircraft in a training environment to enhance blue force (U.S. and allied forces) pilots' aerial combat proficiency. The F-5s serve as simulated red forces (adversary forces).

In January 2002, the importance of the F-5 Adversary Program was highlighted by an Office of the Chief of Naval Operations (OPNAV) requirement that F-5 aircraft remain in service until at least fiscal year 2015. While that might have seemed like welcome news to the Adversary Program, existing data proved that such a requirement would be difficult to achieve. A Naval Air Systems Command February 2001 fatigue life study of existing F-5s concluded that the airframe's fatigue life values expended had increased approximately 39 percent higher than originally anticipated—to an average of 79 percent per aircraft. That percentage was expected to continue to rise at an annual rate of 3 to 5 percent per aircraft. The bottom line was that the Adversary Program's F-5 fleet expected to show an increased rate of structural repairs in order to meet the OPNAV requirement. The Adversary Program had a structural repair program in place to provide estimated repairs and investments to maintain the F-5's estimated operational tempo; however, there were insufficient structural repair program funds to keep the F-5 fleet operational through 2015 after factoring in the 2001 fatigue life study.

Without a substantial increase in the structural repair program budget, 73 percent of the existing F-5 aircraft were expected to drop out of service by fiscal year 2007. The question became how could the F-5 Adversary Program meet its training mission goals in accordance with the OPNAV requirement while faced with insufficient structural repair program funds and fatigued aircraft?

An Out-of-the-Box Acquisition Approach

To solve the Adversary Program's problem, the first option considered was modification of the current F-5 fleet, and that option was a non-starter due to a lack of structural repair program funds. The second option was to acquire new F-5 aircraft and perform one-for-one swapouts with existing airframes. However, the F-5 aircraft production line had been closed for more than 10 years, and any production restart—if at all possible—would not field equipment in time to meet the OPNAV requirement.

Undeterred, the Adversary Program continued to broaden its search and found an innovative solution: reverse foreign military sales (FMS).

Buying Aircraft Back

In the late 1980s, Switzerland procured more than 70 F-5 aircraft via a U.S. Air Force FMS case. A restructuring of the Swiss Armed Forces made some of their F-5 aircraft expendable. Using an out-of-the-box acquisition approach, the F-5 Adversary Program considered the possibility of buying back some of the Swiss F-5 aircraft. The attraction was that the Swiss F-5s were low-time aircraft (2,500 flight hours per aircraft) compared to the high-time aircraft (7,000 flight hours per aircraft) currently being flown by the U.S. Navy and Marine Corps adversary squadrons.

"The Swiss aircraft had very few flight hours and were in great shape, so it was an attractive option from the beginning," said Lt. Cmdr. Jason Goff, the Adversary Program deputy program manager within Naval Air Systems Command, PMA 207 (Support and Commercial Derivative Aircraft) and contributor to this article.

The F-5 Adversary Program team members immediately recognized the benefits of such an innovative acquisition approach, but they needed to quickly assess whether the solution was defendable. After all, time was of the essence because Switzerland planned to entertain the first acceptable purchase proposal regardless of who the potential buyer might be.

Assessing Against the PM's Scorecard

Any program manager's scorecard is graded first and foremost on three criteria: performance, cost, and schedule; and the F-5 Adversary Program team reviewed all criteria when assessing whether the reverse FMS approach was feasible.

Performance

Procuring the Swiss F-5 aircraft would result in a more capable platform that would challenge U.S. Navy and Marine Corps pilots. Performance enhancements integrated from the Swiss aircraft would include an improved inertial navigation system, new radar warning receiver

capability and chaff/flare capability, added anti-skid capability, improved airborne radar capability, and standardized cockpit configuration.

The approach would also avoid costly landing gear and engine investments that the F-5 Adversary Program needed to address if its current aircraft were to continue to be used, as the landing gear and the engines would need to be replaced in time. In addition, using the low-flying-time Swiss aircraft would avoid the costly "on condition" (i.e., as required) replacement of some of the current F-5 aircraft's dorsal longeron (the beam that runs along the top length of the aircraft providing airframe structural support) required as a result of fatigue issues.

When viewing those advantages from a systems-of-systems perspective, the F-5 Adversary Program made the early observation that using the Swiss aircraft as one-for-one replacement aircraft—augmented with select components from the current U.S. F-5 Adversary airframes—would be the most cost-effective approach.

To best ensure that the challenges associated with realizing those performance enhancements were identified and effectively resolved, the F-5 Adversary Program relied heavily on an integrated product team (IPT) approach. That organizational structure paid huge dividends during the Swiss reverse FMS initial deliberations because the prime contractor for F-5 maintenance—Northrop Grumman—was involved in all discussions from inception. Therefore, when the Adversary Program began to recognize the benefits associated with using low-time Swiss F-5 aircraft, the Northrop Grumman team was able to assist in selecting the best components to cross-deck from existing U.S. F-5 aircraft into the Swiss F-5 aircraft. Northrop Grumman also understood the scope of work involved for each conversion—including life cycle logistics and government manual/drawing updates.



How could the F-5 Adversary Program meet its training mission goals in accordance with the OPNAV requirement while faced with insufficient structural repair program funds and fatigued aircraft?

In addition, Northrop Grumman was able to prepare its depot maintenance facility in St. Augustine, Fla., in advance to hit the ground running when the first Swiss aircraft arrived in 2003 as well as develop specialized dollies for uploading/downloading disassembled aircraft for C-130T aircraft transport.

According to Mike Ingalls, Northrop Grumman's F-5 program manager and a contributor to this article, "Being treated as an equal partner and having our expertise proactively sought from the very beginning made all the difference in being able to meet the program's aggressive schedule."

The new "replacement" aircraft was designated the F-5N to differentiate it from the existing U.S. Navy/Marine Corps F-5 fleet, which were designated F-5E.

Cost

As with most "restructured" programs, cost quickly becomes a major topic. As it turns out, the cost of using Swiss F-5 aircraft actually turned out to be one of the reverse FMS initiative's biggest selling points. As you might guess, it was not a straightforward solution and required the F-5 Adversary Program team to once again display its ability to embrace acquisition innovation.

The main problem was that the purchase initiative required procurement funds, and the F-5 Adversary Program had very little funding because the production line had long since shut down. Most of the existing budgeted program funds were in the structural repair program's Operational Safety Improvement Program, intended for modification and maintenance of the existing U.S. F-5 fleet. However, the Adversary Program realized that using the Swiss F-5 aircraft eliminated most of the budgeted structural modification kit requirements. Knowing that, the F-5 Adversary Program took actions to successfully reprogram the now-available funds for an initial buy of 15 Swiss aircraft.

In addition, the Adversary Program recognized that the reverse FMS purchase would decrease modification and repair costs in the out-years, to include the procurement of components necessary to keep the existing F-5 fleet operational.

By using the Swiss aircraft as replacements, an additional realignment of budgeted out-year funds enabled the purchase of an additional 17 Swiss F-5 aircraft.

It does bear mentioning that one of the most important tenets of today's acquisition process was not forgotten: life cycle logistics support. For virtually cents on the dollar, the F-5 Adversary Program team negotiated the inclusion of critical spares and ground support equipment to ease the logistics burden of introducing Swiss F-5 aircraft into the U.S. Navy/Marine Corps inventory.

In addition, the Navy negotiated a firm fixed-price contract to minimize risks. Using that particular contract vehicle placed the entire burden upon the Swiss once negotiations were concluded and the contract was formally signed.

Upon completion of negotiations with Switzerland, a final agreement was reached for the Navy to procure a total of 32 Swiss F-5 aircraft. Most important, the ability to identify a reprogramming path forward allowed the F-5 Adversary Program to accomplish the entire reverse FMS initiative—32 aircraft with associated spares and ground support equipment—within the program's $43 million budget, and no additional Navy funding was required.

As a final testament to the cost savings realized with the Swiss initiative, the Navy Reserve allocated funding in fiscal year 2004 and 2005 to procure 12 additional F-5 aircraft. Once converted to the F-5N configuration, the aircraft enabled the F-5 Adversary Program to establish the previously mentioned (and newest) F-5 Adversary base of operations—Naval Air Station Key West. Thus, a total of 44 Swiss F-5 aircraft quickly became the revitalized backbone of the U.S. Navy/Marine Corps Adversary squadrons.

Schedule

As previously mentioned, the F-5 Adversary Program was under intense time pressure to reach an agreement with the government of Switzerland. In addition to the concern of other governments procuring the available Swiss aircraft, the F-5 Adversary Program team also had to worry about how the timing of reprogrammed/realigned funding actions affected the program's schedule.

Unless necessary approvals were obtained by early 2003, the Adversary Program would have to obligate $15 million of maintenance and spare parts funds in order to keep the existing U.S. Navy/Marine Corps F-5 fleet operational. Having to obligate those funds would decrease the funds available to procure Swiss aircraft, which would delay the Swiss procurement by one year. There were simply not enough funds to both continue maintenance/spare parts efforts for the existing U.S. F-5 fleet and concurrently designate program funds to procure Swiss aircraft. It would need to be one or the other, but not both.

Eventually the F-5 Adversary Program was able to gain the necessary approvals required—including congressional—to proceed with the Swiss F-5 procurement initiative by supporting numerous acquisition strategy and program review meetings and discussions with senior-level officials both internal and external to DoD. The approvals were, for the most part, all gained within a 12-month period. The efforts expended by the F-5 Adversary Program to gain the approvals again pointed to the importance of the IPT organizational structure. Without such an organizational approach, the F-5 Adversary Program would have had to scramble in order to ensure all affected stakeholders agreed with the proposed acquisition approach. However, with the Adversary Program relying upon a healthy IPT organizational structure from program inception, there was the assurance that all major stakeholders were well aware of the goals and benefits afforded by changing the program's path to a Swiss aircraft procurement approach.

Gaining the necessary approvals meant the F-5 Adversary Program was able to structure a program that would ensure a successful accomplishment of the OPNAV goals—maintaining F-5 Adversary mission support for training and tactics development without any degradation through the 2015 timeframe. With those approvals, the converted Swiss F-5 aircraft acquisition initiative was given an acquisition category (ACAT) IVM designator, which signifies that formal developmental or operational testing was not required.

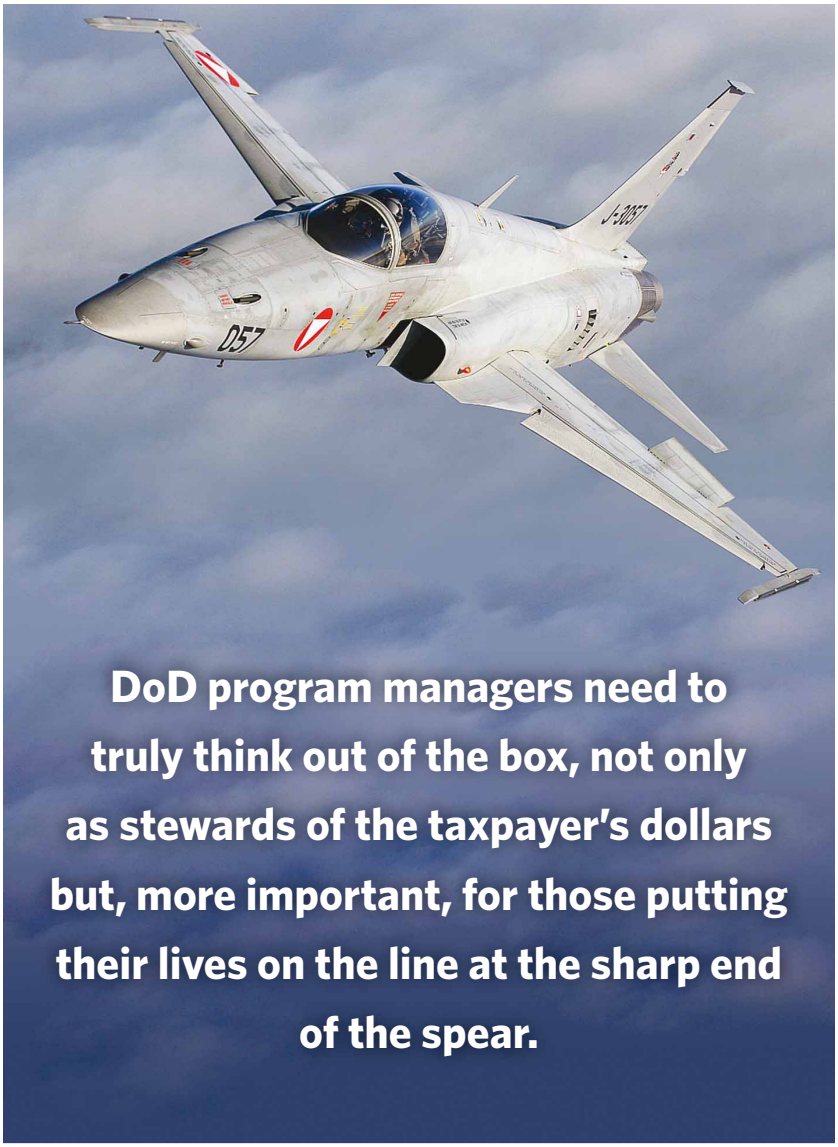
The previous paragraphs cannot possibly provide the full perspective of challenges the F-5 Adversary Program faced in order to structure a program that met all performance, cost, and schedule requirements. As observed by Capt. James Wallace, PMA 207's program manager and contributor to this article, "Even though we had a superb working relationship with the Swiss government and Northrop Grumman, it did not automatically translate to smooth sailing. The program's timelines, cost constraints, various stakeholders, and numerous other issues made it necessary for us to constantly maintain situational awareness in order to keep things on track."

The Need for Flexibility

In addition to managing performance, cost, and schedule, any successful acquisition program needs to remain flexible in order to handle the inevitable changes and challenges. In that regard, the F-5 Adversary Program was highly successful on a number of fronts.

Congress

The nature of the reverse FMS approach necessitated congressional approvals before the first Swiss F-5 aircraft could be picked up by a C-130T transport aircraft. The short timelines available for a congressional approval needed to be coordinated among four major committees: the House and Senate committees on armed services, and



DoD program managers need to truly think out of the box, not only as stewards of the taxpayer's dollars but, more important, for those putting their lives on the line at the sharp end of the spear.

the House and Senate subcommittees on defense appropriations.

Department of State

The Department of State needed to provide third party transfer certification approval for any foreign country wanting to retransfer defense articles back to the United States that were originally provided under an FMS case.

Delivery of Initial Aircraft

Just when everything was falling into place for a USN C-130T pickup of the first aircraft in Switzerland, higher-priority mission requirements associated with the Global War on Terrorism prevented the C-130T from meeting the initial delivery date of Swiss F-5 aircraft to the Northrop Grumman facility.

Government Approvals

Internal debates within the government of Switzerland over whether to provide final government approval arose at literally the last minute. In fact, U.S. Navy personnel were actually in Switzerland when that occurred.

Those four examples are just a sampling of the challenges faced by the F-5 Adversary Program across the entire initiative, spanning more than six years. But the F-5 Adversary Program is not unique—just about any acquisition program in today's environment will face its own set of unique and challenging obstacles that can only be overcome with an inherent ability to remain flexible.

Success from Innovation

From all accounts, the F-5 reverse FMS initiative is a success story. It's not often that a program office contemplates going to a foreign government in order to buy back something as complex as an F-5 aircraft to meet a critical mission support capability—and succeeds! In fact, the program was so successful that Jay Bolles, PMA 207's IPT lead for the F-5 Adversary Program and contributor to this article, said, "We are forecasting to have at least 80 percent of the aircraft last past 2020."

As someone very familiar with the importance of the F-5 Adversary Program, Vice Adm. Thomas Kilcline, commander, Naval Air Forces; and commander, Naval Air Force, U.S. Pacific Fleet, said, "The F-5 will remain crucial to our adversary forces in both quantity and capability for the foreseeable future. Buying back these F-5s from Switzerland is a great example of innovative thinking on the part of our acquisition partners. ... The Adversary Program is one of our vital training assets—an asset all of our air wings train against prior to deployment. Our red adversary force helps ensure our naval aviators will continue to be the best-prepared aerial warfighters in the world."

There is a need to advocate innovation throughout DoD's programs. It needs to be more than talking points by those merely parroting current acquisition policies. DoD program managers need to truly think out of the box, not only as stewards of the taxpayer's dollars but, more important, for those putting their lives on the line at the sharp end of the spear.

The authors welcome comments and questions and can be contacted at jay.bolles@navy.mil, william.broadus@dau.mil, william.conroy@dau.mil, jason.g.goff@navy.mil, mike.ingalls@ngc.com, mike.kotzian@dau.mil, duane.mallicoat@dau.mil, and james.wallace@navy.mil.

Testing to the Sound of the Guns

The Comparative Testing Office

Col. Richard E. Burns, USAF

When soldiers in the 116th Brigade Combat Team took fire near Kirkuk, Iraq, they located and captured the attacking insurgents using a gunfire detection system. Afterwards, the soldiers e-mailed the U.S. Special Operations Command (USSOCOM) program office responsible for obtaining the system, saying, "Thanks so much for getting this system and training to our soldiers."

The gunfire detection system was developed in France and tested by USSOCOM using programs within the Office of the Secretary of Defense's Comparative Testing Office (CTO). The programs rapidly find and test U.S.- and foreign-developed technologies for warfighting use. For program managers, the CTO programs allow them to speed the acquisition process and avoid research and development (R&D) costs. For warfighters, the CTO programs' tested technologies can solve battlefield problems as well as cut support costs. For some industry participants, the programs provide an opportunity to enter the U.S. defense market for the first time.

Burns *is the director of the Comparative Testing Office.*



Hunting for Technology

Defense R&D is more widespread than ever before. In 1981, a few large companies—those with more than 25,000 employees—did 70 percent of U.S. industrial R&D. By 2006, a wide range of smaller companies were doing most of the R&D. For example, a small, 200-employee company in Washington state developed hermetically sealed cooling for electronics, reducing a system's size and weight. The invention is finding applications across defense product lines.

Defense R&D spending is spread across the globe. Today, 56 of the world's top 100 defense companies (by revenue) and three of the top 10 companies are foreign-based and are producing quality products. For example, world-class ordnance is now provided by such companies as Sweden's SAAB Bofors Dynamics, Germany's Rheinmetaal, and the United Kingdom's Royal Ordnance, to give a few examples.

Many users scout the expanding R&D landscape for new technologies they can quickly use. It's called "open innovation" by University of California-Berkeley Professor Henry Chesbrough and others. It's about "how external technologies can fill the gaps in a company's current business," wrote Chesbrough in his book, *Open Innovation*. About half of Proctor & Gamble's new products are developed externally; and companies like Intel, Merck, and Cisco follow a similar strategy.

And so do others. Iraqi insurgents have sought and acquired high-tech systems like night-vision devices. The Hezbollah use unmanned aerial vehicles and have built missile arsenals surpassing other nations' inventories. The Department of Defense must stay ahead in the race for technology.

Speed counts in meeting the rapidly changing challenges of the battlespace as well as the marketplace, and that means we must harness today's technologies to meet those challenges. In today's security environ-

The Foreign Comparative Testing Program helped DoD avoid $7.6 billion in R&D costs. The Defense Acquisition Challenge Program avoids $9 in R&D and maintenance cost for every $1 spent on testing.

ment, warfighters can't wait years for the 99 percent solution. As Secretary of Defense Robert Gates has stated, "Stability and counterinsurgency missions require 75 percent solutions over a period of months." U.S. warfighters face asymmetric threats, and they must use the best technology they can find to counter those threats.

Leveraging Technology—What it Means for Acquisition and Warfighting

The CTO is a small office within the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, within the Office of the Director for Defense Research and Engineering. It selects Service- and USSOCOM-nominated projects and then funds the acquisition of test articles and subsequent testing. Through highly skilled offices in the Services and USSOCOM, testing is completed and future procurements are planned. Over the last few years, the CTO, Service, and USSOCOM offices have "tested to the sound of the guns," rapidly finding and testing U.S.- and foreign-developed technologies for warfighting. Two complementary programs are overseen by the CTO, enabling it to find and test technologies:

Defense Acquisition Challenge Program. This program domestically searches for and tests U.S. technologies. It allows anyone, in or outside defense, to propose technologies that could rapidly improve acquisition programs; and that includes performance, manufacturability, and/or affordability. Each year, the program issues a broad area announcement in *Federal Business Opportunities* requesting such proposals. Since its inception in 2003, the program has initiated 119 projects involving companies in 33 states.

Foreign Comparative Testing Program. This program globally searches for and tests foreign technologies. Program personnel search for foreign technologies at trade shows, in publications, and through business and government contacts. The program annually solicits technology proposals from the Services and USSOCOM that have the potential to meet warfighter requirements. Since its inception in 1980, the program has initiated 601 projects involving 29 allied and friendly countries.

Both programs have a high procurement rate. Over the last eight years, 80 percent of the projects that tested successful led to procurements. The reason is a disciplined process focused on Service and USSOCOM needs, and a "test-to-procure" policy. For 2009, 75 technologies were proposed as projects for both programs. Of those, 24 were selected for testing. The CTO reviews each proposed project for innovation, technological maturity, and ability to meet warfighter needs. Additionally, the office verifies a successfully tested technology has a viable procurement path planned.

The programs save R&D funds, helping program managers avoid major R&D costs by leveraging already-developed technologies. For example, the RG-33 Mine Resistant Ambush Protected Vehicle program used a German aluminum alloy ballistic liner that offered better protection than other lightweight materials. The program's use of the German aluminum alloy allowed DoD to avoid an estimated $2.5 million had a comparable material been researched and developed, while a U.S. Army evaluation through the Foreign Comparative Testing Program cost only $521,000.

Over the last 29 years, the Foreign Comparative Testing Program has helped DoD avoid a total of $7.6 billion in R&D costs. On average, it has provided program managers with a 7-to-1 cost avoidance—avoided $7 in R&D and maintenance costs for every $1 spent on testing. The much-younger Defense Acquisition Challenge Program is providing about 9-to-1 cost avoidance.

The programs also accelerate fielding. Many projects complete Service/USSOCOM testing in about two years, with some finishing faster. For example, the Marines needed a combined heating, cooling, and generator unit towable by a Humvee. Within a year, the Marines tested products through the Defense Acquisition Challenge Program and fielded a solution. On average, the Foreign Comparative Testing Program cuts fielding timelines by about five to seven years.

Significant Impact

The programs' tested technologies often don't get big headlines, and some seem technologically unexciting. But they can have big impacts for warfighters.

New Capabilities

The programs can quickly test systems that fill capability gaps. When Special Forces operators needed a new rifle, the Foreign Comparative Testing Program came up with a Belgian-developed Special Operations Force Combat Assault Rifle—the first modular rifle with enhanced accuracy at extended ranges. Today, Afghanistan- and Iraq-bound medics get realistic training on a Florida-based company's Mini-Combat Trauma Patient Simulation System, which is

a computerized mannequin simulating combat injuries that was tested by the Defense Acquisition Challenge Program.

Improved Performance

The programs help insert new technology into existing systems, enabling them to do more. For example, Marine Corps M1A1 tank gunners used to keep one eye glued to a sight to view infrared target images. After going through the Foreign Comparative Testing Program, the Marines incorporated a British-developed Biocular image control unit into the M1A1 tank, allowing gunners to kick back and look at the picture, thus reducing fatigue and improving crew performance. After use in Iraq, tank gunners gave the following feedback:

- "Picture was unbelievable!"
- "We could view buildings over 5,000 meters away and call in the ten grid information for strikes."
- "With the improved resolution of the system, we used it to look for and find IEDs."

Similarly, the Army's Black Hawk helicopter is getting increased range and climb rate as a result of materials in its tailcone being replaced by lighter-weight materials, called X-Cor™ and K-Cor™, successfully tested by the Army through the Defense Acquisition Challenge Program.

Faster Warfighting

Speed in war is essential, as noted by historical military strategists such as Carl von Clausewitz and Sun Tzu; and the programs' tested technologies are accelerators. In Afghanistan and Iraq, artillery units cut their set-up time for firing by one-third through the use of a Swiss-developed system that accurately positions the unit's guns relative to maps and earth terrain. It was assessed through the Foreign Comparative Testing Program. And today, one Marine, using software tested by the Defense Acquisition Challenge program, can plan communications for an upcoming operation in 20 minutes, thus replacing a previous process taking two Marines up to 24 hours to complete.

Extended System Use

Through Defense Acquisition Challenge Program testing, the Air Force found ceramic matrix composite seals for F-16 jet engine nozzles lasted six times longer than older metallic seals. And a Russian-developed titanium nitride coating has reduced sand erosion in turbine engines in Navy and Marine Corps helicopters operating in Iraq and Afghanistan today, increasing their flying rates tenfold over those in Operation Desert Storm, thanks to the Foreign Comparative Testing Program.

Reduced Maintenance

Sailors on aircraft carriers frequently had to replace nitrogen bottles that cooled infrared seekers in Sidewinder missiles. That maintenance was eliminated with a United Kingdom-developed and a Foreign Comparative Testing Program-tested high-pressure pure-air generator, saving about $50 million in life cycle costs. Additionally, a Defense Acquisition Challenge Program-evaluated system for troubleshooting aircraft jamming pods reduced maintenance and required less calibration than previous systems.

Broader Value

While the CTO helps warfighters and program managers, its impact goes far beyond supporting just those in DoD—it is expanding the defense industrial base. Over the last three years, more than 25 percent of the companies with winning proposals under the Defense Acquisition Challenge Program had not done previous business with the Defense Department. They also bring some non-traditional thoughts and development to the department.

An example is a Georgia-based medical technology company. It proposed, via the Defense Acquisition Challenge Program, an acoustic shockwave therapy for warfighters' soft tissue wounds—an anesthesia-free, non-invasive, easy-to-use treatment promising rapid healing. The Army is now evaluating the technology.

Today, one Marine can plan communications for an upcoming operation in 20 minutes, thus replacing a previous process taking two Marines up to 24 hours to complete.

The programs are also creating jobs. Defense Acquisition Challenge Program projects have led to production in 36 states. There is a perception that the Foreign Comparative Testing Program takes jobs and business away from the United States; in reality, it is the exact opposite. Most Foreign Comparative Testing Program procurements lead to licensing agreements with the foreign developers, resulting in technology being manufactured in the United States. An example is the widely used Buffalo mine-clearing vehicle, which was developed by a company in South Africa but is now produced by a South Carolina-based company that makes hundreds of vehicles for U.S. and allied nations. To date, manufacturers in 33 states have produced technologies through the Foreign Comparative Testing Program.

Additionally, the programs are helping defense "go green," and they are helping program managers meet environmen-

Testing *continued on page 33*



On Failure

Maj. Dan Ward, USAF
Maj. Chris Quaid, USAF
Maj. Gabe Mounce, USAF

Try as hard as we may for perfection,
the net result of our labors is an
amazing variety of imperfectness.
We are surprised at our own versatility
in being able to fail in so many different ways.

Rev. Samuel McChord Crothers, American essayist

Failure is inevitable.

That may be a strange sentiment to come from a group of wild-eyed optimists like ourselves, but it is one we stand behind with confidence. Let's say it one more time, with feeling: *Failure is inevitable*. Go ahead—take a moment to let that sentence sink in.

Unfortunately, people in organizations like the Department of Defense and NASA tend to say things like "Failure is not an option," as if such bravado could somehow ensure unmitigated, unvarnished, unequivocal success. While such a dramatic statement makes for an inspiring movie quote, it can have a bad effect in real life. We think it reveals a counterproductive fear of failure and a fundamental misunderstanding of what failure really is. The problem is that people who think failure is not an option may feel the need to call it something else when failures occur—and trust us, they occur—which can lead otherwise honorable people to dissemble, deny, and disguise failures. The truth is, failure is *always* an option. Indeed, failure is inevitable.

The inevitability of failure doesn't mean success is impossible. It simply means that given sufficient time and multiple attempts to accomplish any given objective, we can all expect a certain amount of failure. No matter how smart, talented, focused, prepared, hard-working, or lucky we are, sometimes things just don't turn out the way we planned. Failure is an

Ward *is currently assigned to the Acquisition Chief Process Office at SAF/AQ. He holds degrees in electrical engineering, engineering management, and systems engineering; and he is Level III certified in SPRDE and Level I in PM, T&E, and IT.* **Quaid** *currently works for the secretary of the Air Force, Office of Special Projects. He holds a Master of Business Administration degree and a Level II COTR certification.* **Mounce** *holds an advanced degree in electrical engineering from the Air Force Institute of Technology. He is Level I certified in T&E and PM.*

inescapable part of the human condition, and the sooner we recognize that, the better. Of course, when lives are on the line, the only *acceptable* failure rate is zero. Unfortunately, in the long run, a zero-percent rate of failure is impossible.

A vast army of experts and success gurus happily tell us failure is good and an important part of learning and growth. They trot out dusty old examples like Michael Jordan getting cut from his high school basketball team and drone on about how we miss 100 percent of the shots we don't take. Fine. They may be right; failure might be good for us, but that's not what this article is about. We are simply here to point out that failure is *inevitable*, and to tactfully observe that we all miss a certain percentage of the shots we *do* take. Whether that's good news or bad isn't important right now. We just want to help everyone recognize the reality of failure's inevitability.

The Quality of Failure

While nobody can avoid failure entirely, it *is* possible to influence the direction in which we fail. Failures may never be "good," but some failures are better than others. In his book *The Black Swan*, Nicholas Taleb suggests aiming to create "situations where favorable consequences are much larger than unfavorable ones." That is, we ought to pursue situations in which the benefits of a positive outcome significantly outweigh the cost of a negative outcome—recognizing, of course, that even our attempts to do so will, upon occasion, fail.

We invite you, dear readers, to consider two ways to improve our inevitable failures. The first is to minimize exposure to loss. The other is to ensure that any negative outcomes become learning experiences and building blocks for future endeavors. (Yes, just like the failure-is-good-for-you idea that success gurus recommend. Sigh.)

The ideal failure, we believe, is one in which exposure to loss is low and opportunities for learning are high. Such a failure, in which little is lost and much is learned, could be termed an *optimal failure*. In contrast, a *negative failure* is one in which much is lost and little is learned. The table below illustrates the differences between optimal failure and negative failure.

Failure Types	Exposure to Loss	Opportunity to Learn
Optimal	Low	High
Negative	High	Low

Acquisition project leaders would obviously prefer to succeed, but they should remember that a certain amount of failure is inevitable. And unfortunately, negative failures are arguably the only kind of failure a major defense acquisition program can experience, given the typical MDAP's enormous budget and decades-long schedule. Every time an MDAP fails, it fails spectacularly, costing billions of dollars and teaching too little, too late. That doesn't mean we shouldn't have MDAPs, but it certainly means we should be aware of the risk.

Of course, even projects below the MDAP threshold can experience negative failures, given enough years and dollars. Whenever large quantities of time and money are expended, we are exposed to significant loss. If a large percentage of participants have moved on to other projects and/or retired before the failure is observed, our opportunity to learn is low. And frankly, even if the original decision makers are still around and directly witness the consequences of their actions, it is often too late to apply any lessons learned because learning requires both *observation* of the phenomena and *timely reflection followed by action*—neither of which is likely in big, lengthy, expensive projects.

Let's get specific. From 1983 to 2004, the U.S. Army spent $7 billion developing the Comanche helicopter, then cancelled the program and had zero aircraft to show for their troubles. In February 2004, Lt. Gen. Richard Cody, deputy chief of staff, G-3, said, "If you told me six months ago that I would be standing here saying the Army no longer needs the Comanche helicopter, I wouldn't have believed you." That admirably honest statement highlights the inherent difficulty in learning from experience on a long project, and shows that we really don't know what the lessons will be until the story is finished. For nearly 21 years, the Army apparently thought things with the Comanche were just peachy, maybe even worthy of imitation. They didn't have the opportunity to learn the true lessons of the Comanche until it was cancelled. Until that moment in 2004, there's a good chance the Army was learning—and teaching—the wrong lessons from their $7 billion tuition payment to Experience University.

We're not trying to pick on the Army, but their Crusader artillery piece has a similar story, albeit on a slightly smaller scale. The Crusader took only seven years and $2 billion before it was cancelled in 2002, having delivered zero artillery. Interestingly, two months before Crusader was cancelled, C. Emerson published an article in *Field Artillery* magazine, "Crusader: Hammer for Today, Forge for the Future," in which he stated that the project was on schedule,

Acquisition project leaders would obviously prefer to succeed but should remember that failure is inevitable.

on budget, and a mere six years away from being fielded. We could fill this magazine with similar stories from *all* the military services, but two is probably enough to make the case that until we see the end of the story, it is difficult to glean meaningful lessons; and the longer the development timeline, the harder that is.

In both cases, we probably gained *something*—some new technology that survived the cancellation and could be used on a future project, perhaps. A negative failure is not necessarily a total fail or a complete loss, but it's not exactly optimal either. Since failure is inevitable, we really shouldn't put ourselves into a position to encounter negative failures if we can help it. Fortunately, there are alternatives, in which our exposure to loss is smaller and the opportunity to learn is larger. Regular readers of our articles may have already guessed where this is heading.

Optimizing Failure: Think Small

We introduced the FIST (Fast, Inexpensive, Simple, Tiny) model for acquisitions in an earlier series of articles, culminating in "FIST Part 5" (*Defense AT&L*, May-June 2006). By design, FIST projects are low-cost and rapid. Unlike what happens in the traditional approach, the inevitable FIST failures are discovered before much time and money are expended, reducing our exposure to loss. FIST failures also have a high probability of conveying meaningful lessons learned because on a small team with a fast schedule, project leaders actually witness the impacts of their decisions and can directly learn from—and share—their experiences.

This approach to failure is one of the guiding principles behind FISTy approaches like extreme programming, spiral development, agile acquisition, and NASA's Faster, Better, Cheaper (FBC) initiative. We cannot dismiss those approaches because they sometimes fail. *Everything* fails sometimes; even rigorously controlled MDAPs. But when FISTy approaches fail, they tend to do so optimally rather than negatively ... and that's a good thing.

This distinction between negative and optimal failures has an important implication when it comes to accounting for failure. In the traditional technology development model, each project is expensive and takes a long time to complete. Project leaders therefore aim to prevent and avoid failure because traditional failures are negative failures, and negative failures hurt a lot. Accordingly, it makes sense to measure failure rates on a per-attempt basis (i.e., failures-per-cohort or -per-portfolio) and to try to minimize the organization's failure-per-attempt rate.

The FISTy approaches we mentioned two paragraphs ago require a different perspective on failure accounting because they produce a different kind of failure. Optimal failures, while still undesirable, are more tolerable and do not cause as much damage. When attempts are quick and inexpensive, a relatively high failure-per-attempt rate might, therefore, be more acceptable or perhaps even irrelevant. Indeed, a relatively high failure rate should perhaps even be *demanded*.

The ideal failure ... is one in which exposure to loss is low and opportunities for learning are high.

In the early 1990s, when NASA's FBC initiative was launched, then-NASA Administrator Daniel S. Goldin showed an appreciation for the different types of failures when he warned against excessively high success rates. He told the Jet Propulsion Laboratory's staff, "[A] project that's 20 for 20 isn't successful. It's proof that we're playing it too safe." That perspective was possible only because when an FBC project failed, little was lost and much was learned (relatively speaking, of course). So rather than measuring failure on a per-attempt basis, it might make sense to measure FIST failures on a per-dollar basis, with some accounting made for the benefits of learning that optimized failures convey. A dozen failed FIST projects could conceivably cost less (and teach more) than a single failed MDAP. Indeed, NASA's 16 FBC missions, of which 10 were successfully accomplished, cost less than a single traditional planetary mission.

Play Our Failures Right

Let's say it one last time: *Failure is inevitable*. No amount of process, preparation, oversight, or regulation will ensure a 100-percent success rate, even for a large, expensive project that is "too big to fail." Just ask the Comanche team. The best we can do is try to optimize our failures and create situations in which our losses will be low and our opportunity to learn will be high.

Unfortunately, DoD tends to prefer Big Projects, and Big Projects only fail one way—negatively. A framework that relies heavily on MDAPs (and MDAP wannabes) will therefore result in a certain number of painful negative failures. Losses will be high, and opportunities to learn will be few and far between. That's a bummer. It hurts our credibility, wastes resources, diminishes the acquisition community's capacity to accomplish the mission, and ultimately impedes the warfighter's effectiveness.

It doesn't have to be that way. Yes, we're going to fail sometimes, but if we play it right, our failures don't have to hurt quite so much. We might even be able to learn something in the process.

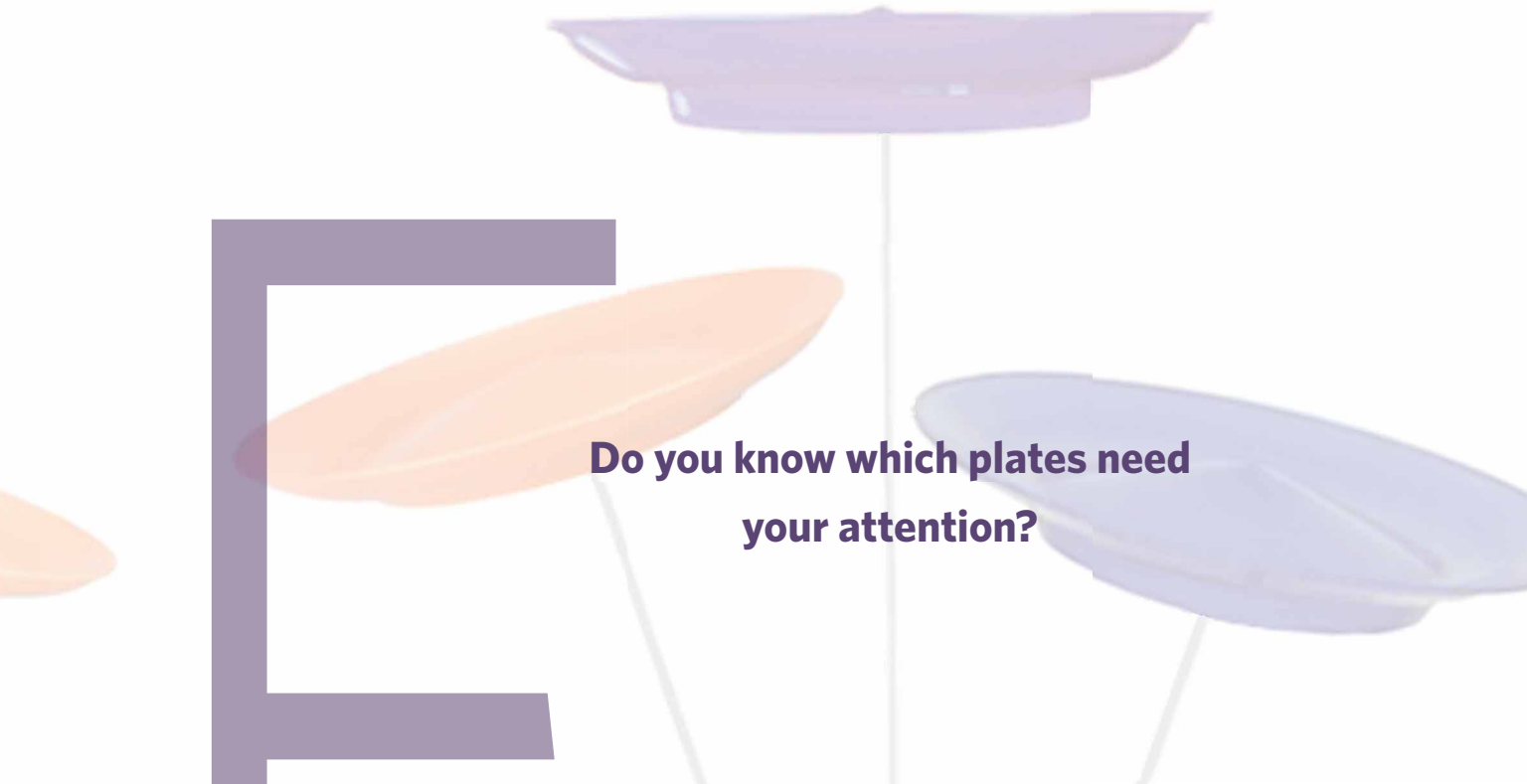
The authors welcome comments and questions and can be contacted at the.dan.ward@gmail.com, chris.quaid@gmail.com, and gabemounce@earthlink.net.



Leaders as Circus Performers

Using Survey Feedback to Keep the Plates Spinning

Fred Jones ■ Doug McCallum ■ Chris Sargent



Do you know which plates need your attention?

Effective leaders know how to get and act upon information from their organization and subsequently effect positive change. Quantum Research International Inc. has conducted numerous surveys in support of government organizations, and this article is written based on our interpretations of those surveys. Typically, the surveys have been for acquisition, technology, and logistics organizations that generally have a matrixed, high-tech workforce. After implementing dozens of surveys with thousands of participants, we have found significant differences in how organizations used survey results. Those organizations that implemented, analyzed, and developed action plans from survey feedback improved organizational performance. Organizations that relegated their survey to the "library shelf" showed no subsequent improvement.

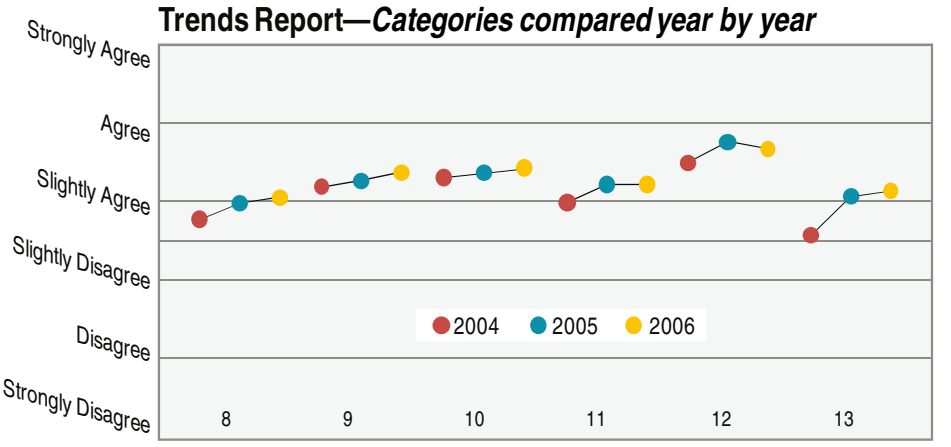
We'll be talking about two kinds of leaders: direct leaders that lead small groups face to face, and indirect leaders that manage larger organizations through subordinate leaders. How these different kinds of leaders use surveys as a tool for building high-performance teams can be illustrated in an analogy using circus performers—a juggler versus a plate spinner.

The direct leader in this analogy is the juggler. He has to constantly apply energy and individual attention to each ball in the air. Direct leadership involves leadership through direct contact, usually by junior leaders, with a relatively small number of team members. Those leaders generally experience more certainty and less complexity in executing their jobs.

The authors work for Quantum Research International Inc., where they support organizations in leadership development, organizational improvement, and knowledge management efforts. **Jones** *is a retired Army officer and former program manager supporting Department of the Army efforts to comply with chemical weapons treaty requirements.* **McCallum** *retired from the Army as the chief of the Leader Development Division, Human Resource Command.* **Sargent** *retired from the Army as the director of the Center for Army Leadership.*

The plate spinner is the indirect leader. Indirect leaders have too many subordinates to maintain a one-on-one controlling relationship with every worker. Like the plate spinner who uses sticks to control the plates without actually touching them, indirect leaders have to develop skills that allow them to provide guidance and control to an organization through subleaders. They must learn how to influence rather than directly control, and they use different leadership techniques to communicate, plan, make decisions, motivate, and get results. This article provides some tips for both the direct leader and indirect leader to manage and respond to surveys.

An Organization's Improvement Trends Based On Follow-Up to Survey Feedback



8. Trust
9. Personnel Management
10. Team Cohesion
11. Communications
12. Organizational Relationships (horizontal and vertical)
13. Survey Feedback (senior leaders will use survey to improve organization)

In our analogy, the indirect leader must learn how to spin a higher number of plates than the number of balls the juggler can keep in the air. That is because indirect leaders, by their very nature, must control larger, more complex organizations, which requires the use of more control and feedback systems. It's the situation in which you're promoted from manager of the 10-person shop to manager of the 45-person section. Now your span of control forces you to look at different ways to be as effective as you were before. Many leaders face a tough transition when they move from a position of direct leadership to a position of indirect leadership. That is often a by-product of fast-moving organizations that can't afford to send leaders away for leader development. If you're an indirect leader, what can you do to remain effective? How can you keep your hand on the pulse of the organization? One solution for indirect leaders is to use surveys to identify the organization's strengths and challenges, and to enact focused improvements that continuously enhance organizational performance. The larger your organization, the more useful such feedback can be. And what follows doesn't apply just to the indirect leaders. Leaders of smaller teams can use even smaller, focused surveys to great benefit.

Benefits of Surveys

Keeping your organization operating at optimal performance requires feedback. There are many ways leaders can gain useful feedback about their organization's performance, but we'll focus on surveys to limit the discussion and because they are very effective. A survey is a highly useful feedback method that promotes understanding of an organization, and helps determine methods and metrics leading to measurable organizational improvements such as increased job satisfaction (thereby reducing turnover), improved communications, increased trust between leaders and subordinates, and early warning of festering issues. Surveys, if designed properly, can support a follow-on strength, weakness, opportunity, and threat analysis. Surveys can also include tailored questions that help generate metrics for performance. The Office of Personnel Management understands the usefulness of surveys, as reflected by its use of survey results in metrics measuring organizational goals.

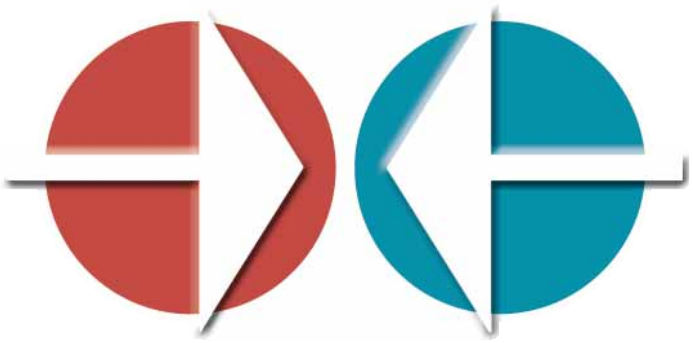
Leaders gain insight about their organizational strengths and weaknesses, which can be used to develop an action plan to improve their team's performance. The figure shows an extract of a report of an organization that has been conducting surveys since 2004. The organization's leader knows what his workforce is telling him, has identified key issues and developed annual action plans, has involved the workforce in developing solutions, and has communicated those efforts throughout the organization. Subsequent surveys have shown a marked increase in organizational performance—the organization consistently improved over the years in almost every category. The organization has developed a reputation as an employer of choice in a locale that suffers a shortage of skilled labor, which is an attribute that gives the organization a clear competitive advantage. The leader used the surveys to better understand how his plates were spinning and to identify ways to improve organizational performance.

Some leaders are biased against using surveys. We have found three main reasons leaders do not use this tool for feedback:

Many leaders have not been exposed to the value of a survey. That is especially true of younger direct leaders who have recently moved to indirect leadership positions. They may have seen survey results, but do not have the experience to understand the necessary follow-up actions to use

the survey information to subsequently improve organizational performance.

Leaders are afraid that negative feedback from a survey will make them look bad. Those leaders may seem overly risk-averse, but they are actually accepting far more risk by not embracing surveys as a tool for continuous improvement. Without some sort of feedback mechanism, they remain unaware of issues and concerns of their workforce. The leaders fail to embrace the adage of "facing the brutal truth," as quoted from the book *Good to Great* by Jim Collins. The book emphasizes the importance of understanding the organization's true environment—no matter how negative.



Keeping your organization operating at optimal performance requires feedback.

Some leaders believe surveys won't provide them useful information. Our experience reveals that survey results never fail to provide feedback that surprises organizational leaders to some degree. A leader who does not have some sort of system to gain feedback usually does not have a good baseline from which to improve the organization. One leader recently told us, "I don't believe in surveys because they all say the same thing: 'We need to communicate better.'" Further questioning revealed that although that leader knew that poor communications was one of the most common obstacles in improving performance, he did not understand the importance of following through and, therefore, made no effort to improve communications within his organization.

What follows are trends we see in many acquisition, technology, and logistics-related organizations. Although many organizations scored well in some areas, we consistently found organizations struggling to improve workforce feedback in the areas of roles and missions, trust, and communications.

Roles and Missions

Senior workers often scored their organization lowest in clear definitions of roles and missions. Comments reinforced confusion about roles, missions, and lines of responsibility. It's usually a learning experience when the managers within a team formally define the products and processes for which they are responsible, as well as to whom they are accountable. Clearly defining roles and missions as well as lines of authority is a tedious job; however, the clarity of purpose and the understanding of roles and boundaries are critical to high-performing organizations. That is especially important when team members are not located together as well as when matrixed personnel from other organizations are integrated into one team.

"In some respects, our organization has confused who to go to for some missions and who is responsible. There are overlaps and duplication of efforts that waste time."
–Survey respondent

Once roles and responsibilities are defined, key metrics can be established at each level of the organization. Data collected on those metrics enable an understanding of the performance levels of the organization so leaders can focus their improvement efforts. The survey statement "Performance metrics are clear and concise" consistently receives "Slightly Disagree" or "Disagree" scores. Written comments indicate a lack of knowledge concerning metrics from many personnel. Metrics need to be well-understood, meaningful, and communicated across the organization.

"The metrics used are only looked at by upper management. There needs to be metrics all the way down to the lowest level."
–Survey respondent

A subset of roles and missions is the integration of matrixed personnel. The concept of matrix management, with essentially two chains of command, can cause friction if not carefully supervised by all leaders. Helping matrixed employees feel like they are full members of the team requires constant attention through well-defined appraisal chains, with leaders emphasizing adequate rewards, a one-team mentality, and the value of matrixed workers. For new leaders, an awareness of the importance of managing matrixed employees may not be obvious and should be part of their training. The lack of role clarity and integration of matrixed personnel has resulted in lower scores from matrixed personnel, which results in personal and professional frustration, thus reducing team cohesion, leading employees to question their leaders' abilities, and ultimately lowering organizational performance. Confusion over lines of authority as well as outdated or non-existent policies and procedures in a matrixed workforce lead to unclear quality standards. The following comment is representative of issues reflected in roles and missions survey results: "At times, there is a lot of friction and conflict with who is responsible for what, and who is in charge of whom. Recommend the PM and functional organization resolve this conflict where everyone knows whom they work for and how the functional fits into the PM shop."



A survey can be the most effective tool to gain organizational awareness, to set and maintain high-quality standards, and to become a learning organization.

Government leaders score low on integrating contractors into a coherent team. Contractors provide the government an invaluable, skilled, and flexible workforce to meet requirements. They generally have significant amounts of experience beneficial to their team, but often, they are seen as lesser persons. That leads many government leaders to neglect contractors in team activities. Some government leaders would espouse inclusiveness, but then contradict their words with actions, e.g., not including contractors in town hall meetings or award ceremonies.

Trust

Trust is frequently the lowest scoring category in surveys. Statements such as "There is a willingness to accept responsibility for failure" and "I feel free to openly speak my mind" generally score below average. Workers who are matrixed and collocated, for example, to a program management office consistently score lower than those assigned to their parent functional office. The two largest groups that typically provide lower scores in the trust category are employees who have been with an organization longer than five years and employees who are in the mid-level grades. Comments often reflect frustration over professional growth or a perceived lack of appreciation of their contributions to the organization (lack of a recognition/awards program).

Unfair Promotion Process

By far, the most written comments received concerning trust relate to the fair administration of promotion opportunities. Survey scores are accompanied by numerous supporting comments indicating a strong perception that many people are pre-selected for job openings. Often, leaders and human resources representatives are surprised by this, saying they emphasize fairness in promotions, but it is a consistent finding in most surveys. That perception can negatively affect loyalty to the organization and can result in increased turnover rates as well as diminished work performance. One leader who was caught off guard when it came up on his survey results for the second year in a row told us he was surprised because he had sent out a memo after the first survey to address fairness in hiring and promotion practices. Effectively addressing that perception with the workforce requires far more than an annual memo. Indeed, some studies suggest workers need to hear new guidance up to 13 times before they get it. Be creative in your solutions. Would forming a small group (a tiger team) to brainstorm solutions and outline a plan help? How about having all hands meetings at lower levels on your team (all-inclusive meetings tend to stifle suggestions)?

"No matter how well you do on the Selection Board, the position is already picked."
–Survey respondent

Honorary Award System

There are still leaders within the government who are not well-versed with the civilian honorary award system, nor do they take the time to recognize their employees. Recognition is a very effective tool, but it is apparently not well understood. Maintaining a good recognition program is an effort well spent. One way to respond to this is to adopt the control measures the military has adopted with awards—they require the number and type of awards be used as a metric in staff meetings. Through such techniques, the military has built a culture of recognition.

"Unless an employee is retiring or moving, individual recognition is rare."
–Survey respondent

Impact of Paypool System

Many comments addressed the shortfalls of the Office of Personnel and Management's new pay banding system, with some indicating the overall impact was to take away previous levels of incentives for the workforce. Others question the equitable administration of the pay pool process. While changing the pay pool process is beyond the level of authority of most leaders, they at least must ensure that any monetary award standards and actions are as transparent as possible.

"Artificial 'glass ceilings' should not be put in place to keep an employee's salary low within a band."
–Survey respondent

Communications

Often the lowest-scoring survey responses are related to organizational communication. That includes vertical and lateral information flow, collecting and disseminating lessons learned, and interaction between core and functional/matrixed organizations. A subset of communications is the use of standardized processes and procedures that support systemic communications and workflow across the organization. The organizations that analyze and decipher survey results to improve communications have seen significant

improvement. There are three areas in which many organizations focus their effort to improve communications—training leaders in interpersonal skills; matching the organization's information/communication requirements with the appropriate communications medium (e.g., e-mail, face-to-face, portals, meeting rhythms, workflow tools, net-based meetings); and including the workforce in the problem-solving process (to include developing processes that address workflow improvements). If you want to see leaders (and their subordinates) improve organizational communications, you have to provide the need for change, the value of changing, and a path forward to improving communications. Consider workshops focused on the leadership team. Such workshops have proven highly effective in the joint development of communications skills and processes (public speaking, counseling, building communication/information management systems, staff coordination, etc.).

"I rarely have communication with my supervisor. We don't have staff meetings. We mainly communicate via e-mail. If he comes in my area, he generally only speaks to the person he has an issue or concern with at that time."
–Survey respondent

Keep the Plates Spinning

Developing mid-level and senior leaders have a challenge to keep the plates spinning. They must understand how to build and oversee control systems (output control, behavior control, and cultural control systems) along with the feedback tools that tell them when the control systems are not working at peak efficiency. A climate survey is a principal feedback tool that can help you understand when the plates need energy and attention, thereby improving your team's performance.

Do you know which plates need your attention? If you do decide to use a survey as a feedback tool, it should be tailored to include not just numerical scores but also several opportunities to generate anonymous comments in text boxes from which you can learn your organizational strengths and challenges. Once you have identified your organizational weaknesses, develop a plan to fix them. Strategically communicating your intentions after the survey is critical. Some successful techniques we have seen include holding a town hall meeting to brief the results and announce that teams (to include Lean Six Sigma/process teams) have been formed to deal with the survey issues. Those teams should provide frequent action plan feedback to the senior leaders as well as to the workforce. Organizations that use such techniques have found improved workforce motivation and significant organizational improvement.

The authors welcome comments and questions and can be contacted at fkjones@quantum-intl.com, dmccallum@quantum-intl.com, and csargent@quantum-intl.com.

Testing *continued from page 23*

Today, 56 of the world's top 100 defense companies (by revenue) and three of the top 10 companies are foreign-based and are producing quality products.

tal requirements. Marines train with a Foreign Comparative Testing Program-tested 40mm practice round that produces an orange flash but leaves no energetic material. Future trucks will likely have environmental control units using a carbon dioxide refrigerant instead of environmentally harmful synthetic refrigerants, thanks to the Defense Acquisition Challenge Program. And in 2009, a United Kingdom-developed disposal system that thermally destroys 90 percent of waste and uses the resulting gases to generate electricity will undergo foreign comparative testing for the Army's forward operating bases.

Significant Value

The CTO programs—the Foreign Comparative Testing Program and the Defense Acquisition Challenge Program—quickly provide U.S. war-fighters the equipment they need to fight asymmetrical wars while saving the taxpayers dollars in the process, but here's their greatest value: they save lives. It's common to say that about a piece of gear. But it's not folks in Washington, D.C., saying it—it's the warfighters. Here are just a few comments warfighters have made:

- "Catching the bad guys equates to saving lives," said users of the gunfire detection system, tested by the Defense Acquisition Challenge Program.
- "We appreciate the help and, truthfully, the lives you probably saved," said a medevac commander referring to MobiMat landing pad, tested by the Foreign Comparative Testing Program.
- "That giant armored beast is no doubt saving lives," said a user of the mine-clearing Buffalo, tested by the Foreign Comparative Testing Program.

And therein lies the most significant reason for considering the Defense Acquisition Challenge and Foreign Comparative Testing programs in your program management office.

For more information, please visit the Advanced Systems and Concepts Web page at <www.acq.osd.mil/asc/>.

The author welcomes comments and questions and can be contacted at richard.burns@osd.mil.



Synergy

Innovation You Can Measure

Eugene A. Razzetti

Merriam-Webster's Dictionary defines innovation as the introduction of something new or different, or the introduction of new things or methods. DoD wants innovation both for and from its warfighters. But if you're a warfighter or program manager:

Razzetti, *a retired U.S. Navy captain, is an independent management consultant and adjunct military analyst. He is the co-author of* The Corporate Responsibility Management Standard MVO 8000 *and author of the book* The Executive's Guide to Corporate Responsibility Management and MVO 8000.

- What does innovation look like?
- How do you know when you've been innovative?
- How do you know if the innovation (once identified) will do any good, especially if you're talking about spending a large amount of time and funding to develop it?
- How much good will it do for the amount of time and funding invested?
- How do you know that a gain in one area won't result in an attendant loss in another?

SYN·ER·GY
A COMBINED ACTION OR OPERATION. A MUTUALLY ADVANTAGEOUS CONJUNCTION OR COMPATIBILITY OF DISTINCT BUSINESS PARTICIPANTS OR ELEMENTS (AS RESOURCES OR EFFORTS).
MERRIAM-WEBSTER

Synergy versus Innovation

Further in the dictionary, Merriam-Webster defines synergy as the combined or cooperative action of two or more stimuli for an enhanced effect. It means that the whole becomes greater than the sum of its parts, and that one plus one can equal 2.5.

In business, synergy can mean that when separate departments within an organization cooperate and interact, they become more productive and efficient than if they had operated separately. For example, it is more efficient for each department in a small organization to deal with one finance department rather than each requiring a finance department of its own.

We can work more effectively with synergy than with innovation because synergy can be quantified, whereas innovation (if not the result of pursuing synergy) often cannot. In this article, I discuss synergy in general and representative synergies for the warfighter in particular, and I discuss how to look for synergies and how to measure their effectiveness. I also attempt to prove that the pursuit of synergy is of greater practical value than the pursuit of innovation.

What is required for the identification of synergies, above all, is a mindset from program managers that says one and one must equal 2.5, or it's not worth doing.

Evolving Synergy

Redundancy ⇨ *Commonality* ⇨ *Synergy*

In the development of synergies, the program manager and the program management office must look for three progressively supporting behaviors:

- Redundancy: Wherein several organizations perform similar activities to achieve the same objectives; leading to
- Commonality: Wherein several organizations perform the same activities to achieve the same objectives; leading to
- Synergy: Wherein one organization, by doing one activity for several similar organizations, achieves more than could be accomplished by all the similar organizations each doing the same activity.

Too often, acquisition processes stop at commonality, confusing it with both innovation and synergy. Defense acquisition has come too far, and DoD's need is too great to be content only with commonality. Commonality is a poor substitute for either synergy or innovation.

How Do You Know It's Synergy?

For our purposes in defense acquisition, synergy refers to the measurable behavior of whole systems not predicted by the behavior of their component parts taken separately. Synergy can play a vital role in planning and financing the conduct of modern warfare. DoD deals with how (and to what degree) the department should integrate those capabilities and assets of diverse component commands,

INNOVATION AND CREATIVITY NEED TO MEASURABLY PROVE THEMSELVES AT THE EARLIEST STAGES OF THE ACQUISITION PROCESS, BEFORE VALUABLE TIME AND FUNDS ARE ASSIGNED TO THEIR FRUITION.

and how combining the capabilities can create something greater than their total.

In the same way, DoD must plan the integration of cultures as it plans for the cooperative success of U.S. and coalition forces. That will likely require a reasonable amount of time for the component commands to work together and achieve a cultural end state that reflects the goals of the commander.

Successful synergistic culture change builds upon the strengths of the components.

DoD has the potential for a high degree of synergy. However, in terms of population, assets, and capabilities, its optimization remains elusive. DoD must develop or combine its material and nonmaterial assets synergistically to achieve and maintain optimal performance of systems and maximum safety and effectiveness for warfighters.

TOO OFTEN, ACQUISITION PROCESSES STOP AT COMMONALITY, CONFUSING IT WITH BOTH INNOVATION AND SYNERGY.

Likely Synergies for the Warfighter

The warfighter and the program manager need to identify synergies across the entire spectrum of operations. The development of courses of (corrective) action requires both synergies potentially realized from the proposed courses of action implementation and the metrics needed to meaningfully evaluate them. The following are synergies that I recently developed to further assess courses of action for a major Navy command.

Enhanced Survivability

Enhancing survivability means quantifiably reducing the risk of loss of personnel and equipment as a result of:

- Development of and qualification in uniform operating doctrine and procedures
- Comprehensive weapons training programs
- Improved personnel protective equipment (e.g., body armor)
- Greater equipment reliability and reduced down time
- Greater speed/maneuverability over land or water.

Force Multiplication

Force multiplication refers to small forces doing the work of larger forces, or of forces with different specializations. An example is the use of barrier materials/equipments or perimeter sensors to preclude stationing of personnel, allowing small numbers of personnel to guard or monitor large areas.

Operational Reach

Operational reach is the distance over which military power can have mass effects and be employed decisively. It may be influenced by the geography surrounding and separating the opponents. It may be extended by locating forces, bases, and aggressive logistics resupply; by increasing the range of weapons systems; or by maximizing the use of the host nation and contract support.

Like-Process Consolidation

For purposes of this article, like-process consolidation means taking processes that have been done by a number of commands and assigning them to a single command or organization. Areas of like-process consolidation in anti-terrorism/force protection include:

- Perimeter security and sentry assignment
- Weapons training
- Operations or command centers
- Replenishment and resupply
- Personnel training and administration
- Operational reporting.

Metrics—Quantifying Synergy Effectiveness

What can't be measured can't be managed.
Paraphrased quote from social ecologist Peter Drucker

As warfighters must have the ability to objectively measure the success or failure of their operations, so must program managers be able to measure or quantify the potential profit or loss from intended procurements. They must be able to measure the components of the acquisition and compare their findings against established standards.

Applying specific metrics to the acquisition allows program managers to:

- Optimally plan the entire acquisition based on mission requirements and available resources
- Establish competition goals
- Evaluate programs while still in progress and assess the ability of the program to meet established goals
- Highlight specific areas for additional support or focus.

Table 1. **Subjective Synergy Metrics**

Metric	*Desired Movement /Change*
Intelligence collection and dissemination accuracy	*Increase*
Risk/vulnerability	*Decrease*
Detection and reporting accuracy	*Increase*
Connectivity	*Increase*
Assessment of preparedness	*Increase*
Mission accomplishment	*Increase*
Maintenance of situational awareness	*Increase*
Accuracy of scanning and other electronic sensors	*Increase*
Weather prediction accuracy	*Increase*
Fallout and decay prediction	*Increase*



Tables 1 and 2 describe core subjective and objective metrics that measure the potential effectiveness of identified synergies.

Subjective Metrics

Subjective metrics, such as those in Table 1, are observable but not quantifiable in terms of hard numbers, such as miles per hour or hits per gun per minute.

Objective Metrics

Objective metrics, like those shown in Table 2, are more easily recognized, understood, documented, and defended in the acquisition process.

When to Employ Identified Synergies

There have been many long and scholarly books on the subject of strategic planning, in which top management inventively implements previously developed goals and objectives, but comparatively little on the actual creation of that strategy. Employment of identified synergies should occur as early as possible in the strategic planning (i.e., the acquisition) process, once the gaps and risks have been identified, as shown in Figure 1.

Regrettably, program managers may have little or no control of initial threat and assessment and during strategic planning. Thus, synergy identification may not occur prior to commencement of the acquisition process. It then becomes imperative to identify and employ the synergies and their associated metrics at the earliest point in the acqui-

Table 2. **Objective Synergy Metrics**

Metric	*Desired Movement/ Change*
Response times (hours)	*Decrease*
Equipment downtime/time degraded (hours)	*Decrease*
Speed of movement (miles/hour)	*Increase*
Throughput (pieces/hour)	*Increase*
Situational awareness/common operational picture (square miles)	*Increase*
Commonality/interoperability (instances)	*Increase*
Unit costs (dollars)	*Decrease*
Delivery times (hours)	*Decrease*
Required training time (hours)	*Decrease*
Route distances (miles)	*Decrease*
Decontamination time (hours)	*Decrease*
Personnel casualties (personnel)	*Decrease*
Extent of operational disruption (days/hours)	*Decrease*

sition process in order to shape and control technology development.

The synergies and their associated metrics should be locked in during concept decision and revisited throughout the acquisition process. The program manager needs a robust, pre-approved set of synergies and metrics in order to shape concept design, and to direct and limit technology development. Synergies also provide continuing guidance and feedback during the systems acquisition and sustainment stages, providing decision (i.e., go/no go) criteria for milestones A, B, C, and for initial operating capability and final operating capability.

PROGRAM MANAGERS MUST IDENTIFY AND IMPLEMENT POTENTIAL SYNERGIES AS EARLY AS POSSIBLE FOR SYSTEMS YET TO BE DEVELOPED.

Synergy + Metrics = Objectives

Implementing synergies begins with aligning them and their associated metrics with the gaps or shortcomings to be addressed in the acquisition, and developing the objectives of the acquisition. The threat and risk assessments (see Figure 1), if properly conducted, should provide the required specificity for identifying the requirements and the synergies, and for planning the acquisition.

Let's assume that we need a watercraft to perform two related missions. One mission requires a maximum sustained speed of only 15 knots. The other mission requires a maximum sustained speed of 25 knots. (Note: The two speeds are for demonstration only and do not reflect any actual programs or analyses.) A watercraft capable of 25 knots is capable of performing both missions. The proper analysis by operators and engineers determines that a single watercraft capable of 25 knots can perform both missions. The development of a watercraft capable of 25 knots is now a defensible objective (or top-level requirement) for program management personnel charged with design and construction of the watercraft.

The ability of the watercraft to achieve the two desired synergies is therefore (along with a great many other things, of course) a function of its ability to achieve and maintain a minimum top speed of 25 knots.

A Different Mindset

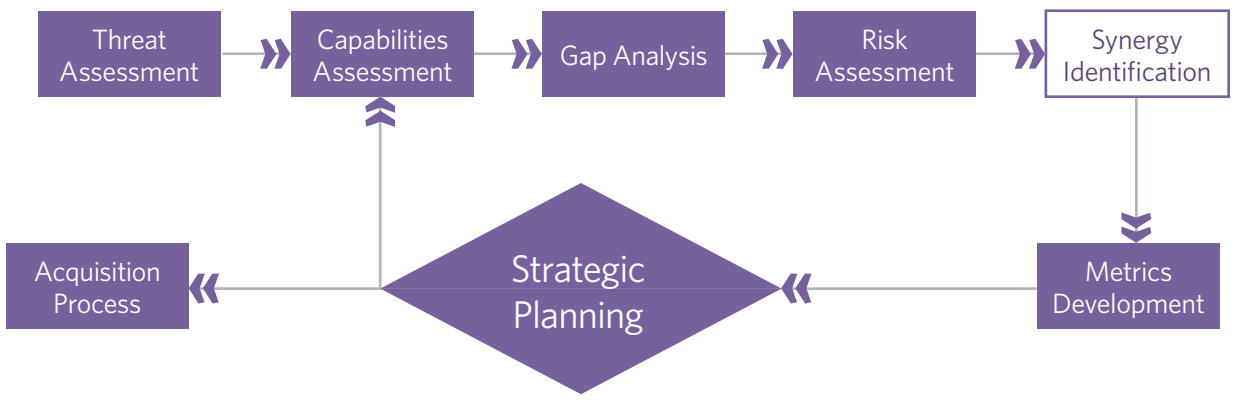
The intent of this article has been to stress the importance of the synergy mindset in warfighters and program managers. My intent is not to trivialize the importance of innovation or, for that matter, creativity. The lesson learned should be never to settle for redundancy or commonality. Innovation and creativity must measurably prove themselves at the earliest stages of the acquisition process, before valuable time and funds are assigned. Innovation must be subjected to the rigors of structured analysis, the most exacting of which is determining what synergies are created or satisfied, and to what degree.

Program managers must identify and implement potential synergies as early as possible for systems yet to be developed. Moreover, they must develop or combine existing material and non-material assets synergistically. Any less of a commitment from DoD impairs our ability to achieve and maintain maximum performance from systems and to ensure maximum safety and effectiveness for the warfighter.

If the innovations are worth the doing, they will survive the scrutiny of the synergy identification process. And be welcomed.

The author welcomes comments and questions and can be contacted at generazz@aol.com.

Figure 1. **The Role of Synergy Identification in Strategic Planning**



Be Willing to Make Changes

But Not Change for Change's Sake

Wayne Turk





Change is hard for most of us, whether it's personal change or organizational change. Change takes us out of our comfort zone. The fact is, you are going to have to implement changes at some time in your professional career. They may be changes you want to see made, or they may be changes that are directed by others. Regardless, you need to know how to manage change in ways that will give you the best chance at success. This article gives some tips for managers on how to manage different kinds of change.

The Need to Change

Changes in an organization are made for different reasons. Some are externally driven by changing technology; a different

Turk *is an independent management consultant with Suss Consulting. A retired Air Force lieutenant colonel and defense contractor, and the author of* Common Sense Project Management *(ASQ Press, 2008), he is a frequent contributor to* Defense AT&L.

Change is best approached through thorough analysis, good planning, large doses of communication, conscientious implementation—and expectation of the unexpected.



kind of workforce (older workers retiring and being replaced by younger workers with a different mindset); uncertain funding; increased competition; global instability (wars, economics, politics, etc.); or changes in law, public policy, or regulatory requirements. Others are the result of internal decisions to increase productivity, efficiency, or profitability; to implement better management; to improve processes (perhaps with more automation); and so on.

Planning, implementing, and managing change in a dynamic environment is the situation in which most managers must now work. At the same time, the organizational culture may be hierarchal, structured, and change-averse (DoD is a perfect example), in which case, it can be difficult to institute meaningful changes. That is especially true for effectively managing change to successfully respond to opportunities and threats. If we do not change, we run the risk of growing stagnant and unproductive in the way that we run our organizations; and we fall behind, which is something no organization can afford.

The Change Process

It can be useful to think about the change process as problem solving. Managing change can be seen as moving from one state to another—specifically, from the problem state to the problem-solved state. Diagnosis or problem analysis is essential. Figure out what is wrong and what is needed for a better result. Discuss approaches with others. Set goals. Plan carefully and obtain buy-in, support, and commitment at all levels. Then move forward. The net effect is a transition from one state to another in a planned, orderly fashion.

Participative involvement from others at all levels is a big help for each step in organizational change. Without that participation and involvement, there will be more resistance to the change. Having people from all levels involved brings in multiple perspectives, identifies unexpected problems, and can generate innovative ideas and solutions. It also creates some of the buy-in that is necessary to overcome resistance and make changes succeed. The participants also plant the seeds of the change movement in their levels of the organization.

Organizations are first and foremost social systems made up of individuals and groups. Ignore people and how they react, and any changes are guaranteed to fail. Organizations are intensely political at all levels. Sometimes it seems that the lower the stakes, the more intense the politics. That describes change at the working level, where people feel their turf is being invaded. Change agents have to understand that and let people know about the change, why it is happening, and why it is good. In order to be willing to change, workers need to know what's in it for them.

Goals, Objectives, and Standards

Too many organizations go for activity-centered changes. We've done it in DoD at times. Management is convinced that if they carry out enough of the "right" change or improvement activities, actual performance results will automatically flow. Some of those "right" improvement activities are collaboration, empowerment (managerial and employee), process benchmarking, customer satisfaction surveys, and other similar techniques. Don't get me wrong—I am a supporter of all of those activities. But without setting specific goals, objectives, and standards, there may not be measurable results—or any performance results at all, for that matter.

Goals and objectives have to be achievable, quantifiable, and measurable. They have to be specific. They cannot be too broad. There should not be too many goals at once. In the beginning of organizational change, go for the low-hanging fruit—the successes that are easiest to achieve. Success breeds success. If people can see that a change has made something easier, better, or more profitable, they are more willing to make other changes.

If goals are too broad or if there are too many of them, people can get discouraged and give up before achieving anything. That is why the results need to be specific and narrowly defined.

It is important to understand the difference between a goal and a standard. Standards describe the minimum level of performance and quality that you are prepared to accept. Goals and objectives are what we aspire toward; they are

targets. Sometimes, however, the change that you implement may just be in the standards that you set. Raising the standards—or raising the minimum levels of acceptance—means that both managers and workers will simply not tolerate anything less.

When you make a change, especially in standards, you may also have to change your beliefs (particularly those that limit change) and those of your people. If you raise your standards but people don't really believe the new standards can be met, then the chance of success has already been sabotaged. Beliefs are like unquestioned commands telling us how things are. Our beliefs tell us what is possible and what is not, what we can and can't do; they shape every action, every thought, and every feeling that we experience. So changing the belief systems is central to making any real and lasting change. It's difficult, but with good communication (including justification, explanation, and plenty of telling them what's in it for them), it can be done.

A Change Management Checklist

For those in search for a checklist for change management, there is no one best way to implement change. We can learn from the experiences of others, however. Change expert Todd Jick, who taught at Columbia and Harvard universities and has written a number of books on organizational change, provides a tentative list of suggestions upon which the following points are based:

- Analyze the organization and its need for change. Look at the organization's history of changes (successes and failures) and patterns of resistance. Analyze the forces for and against change. What will help and what will hurt?
- Create a shared vision. This should reflect the values of the organization and incorporate those from the top management down to the working level. The vision should include the rationale, the benefits, and personal ramifications (the "what's in it for me").
- Develop a non-threatening and preferably participative implementation process. Involve people from all levels in the planning, if possible. Present the plans to all involved, and make information readily available. Explain the benefits for end users. Start small and simple if the changes are large and significant. Go for quick wins. Publicize the successes.
- Separate from the past. Create a sense of urgency.
- Support a strong leader role. The change-advocate role is critical to create a vision, motivate people to embrace that vision, and craft a structure to recognize those who strive toward realization of the vision. Usually this falls to the middle manager.
- Line up political sponsorship. Broad-based support (both formal and informal) is important. Identify and target individuals and groups whose support is needed. That includes those in upper management and the formal and informal leaders at all levels. Define the critical mass of support needed and identify where each key player is on the continuum (from "no commitment," "may let it happen," "help it happen," to "make it happen"). Work to get them all on the side of the change.
- Craft an implementation plan. A plan maps out the effort. It identifies what is changing and how. It doesn't have to be a formal document, but it helps to lay it out in writing.
- Develop enabling structures. Examples of enabling structures might include pilot sites, offsite workshops, training programs, or symbolic changes like redesigned workspaces. Do whatever might help. Sometimes, especially for minor changes, just an explanation of the new process (or whatever the change) will be all that is needed.
- Communicate. Involve people, and be honest with them. Not every change effort calls for full involvement, communication, and disclosure—but most do. Where possible, there should be meaningful dialogue that gives people a stake in the change. This is possibly the most important step for success. Forcing change from the top-down with little or no communication results in almost a guaranteed failure.
- Ownership. Try to develop a sense of ownership in all those involved. If they feel they have some stake, they will strive to make the change a success. This is a part of communication.
- Reinforce and institutionalize the change. It is important to reinforce the change. Reward or recognize those who take risks and incorporate the new behaviors. Don't allow people to slip back into the old ways. Acknowledge their hard work, and thank them for their support.

Resistance to Change

Most of us are about as eager to be changed as we were to be born, and go through our changes in a similar state of shock.
James Baldwin

Strong resistance to change is often rooted in deeply conditioned or historically reinforced feelings. Patience and tolerance (and sometimes creativity) are required to help people in these situations to see things differently. Certain types of people—the reliable, dependable, steady, process-oriented types such as we find in government and the military (and I am not knocking them; I was one for many years)—often find change very unsettling. There are exceptions, of course, but many changes are met with the attitude of "I'll just wait it out. Something will happen, and I really won't have to change." Resistance to change is aggravated because many people (managers and workers alike) have seen supposed changes for improvement come and go with little to show for the process. They have also seen changes that don't make sense, or that make their jobs more difficult.

Another reaction is, "We've always done it that way, and it's worked. So why change it?" The common adage is that if it ain't broke, don't mess with it. When people are confronted with the need or opportunity to change, especially when it's forced on them with little or no explanation of what's in it for the organization and for them, they become emotional and recalcitrant. They resist the change, either actively or

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passive-aggressively. The managers who try to manage the change (if they are not believers) sometime fall into that mindset, too.

Some of that may be changing. Today's workforce is getting younger, and many younger workers want to see change. More work is being contracted out, and contractors (from a profit motive, if nothing else) are implementing changes. Also, because of changing technology, some organizations have had no choice but to change the way that they do business.

Problems and Pitfalls

Let's look at the dark side of organizational change management. No matter what, it won't be easy for any significant change to be implemented. Organizations often just aren't prepared for major changes, or even minor ones, for that matter. If you don't understand and plan for the difficulties, the change will probably fail. And no matter how much thought has gone into the effort, there may be unforeseen impacts. One of those may be unintended consequences, those results that weren't planned for (see "The Law of Unintended Consequences in Project Management," *Defense AT&L*, May-June 2006).

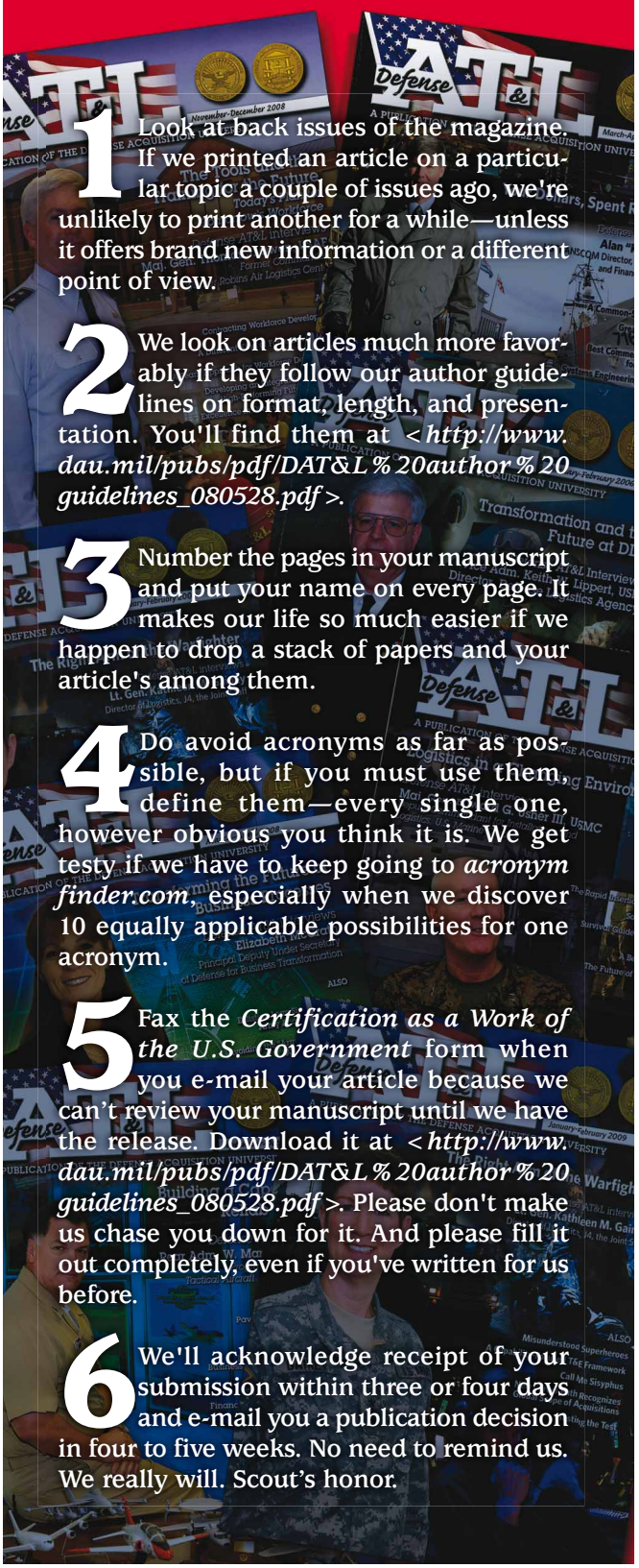
Pointing that out is not meant to scare people away from trying to institute changes; it is just a warning that it won't be easy. A recent study from New Zealand identified the following problems that a majority of the organizations undertaking change experienced. Most can be avoided:

- Change took more time than had been anticipated or allocated.
- Unforeseen problems surfaced.
- Coordination was ineffective.
- Competing crises distracted attention.
- Those involved in the implementation had insufficient capabilities and skills.
- Inadequate training was given.
- Uncontrollable external factors had a major adverse impact.
- There was inadequate support for change.
- Expectations and goals hadn't been clearly defined.
- There was failure to involve all those who would be affected by changes.

In many cases, organizational change has to happen to prevent stagnation, inefficiency, low productivity, and losses to the competition. This article isn't saying that successful change is impossible. It is very possible. But change is hard on everyone. Change is best approached through thorough analysis, good planning, large doses of communication, conscientious implementation—and expectation of the unexpected.

The author welcomes comments and questions and can be contacted at rwturk@aol.com or wayne.turk@sussconsulting.com.

A Six-Pack of Tips for Defense AT&L Authors



1 Look at back issues of the magazine. If we printed an article on a particular topic a couple of issues ago, we're unlikely to print another for a while—unless it offers brand new information or a different point of view.

2 We look on articles much more favorably if they follow our author guidelines on format, length, and presentation. You'll find them at *<http://www.dau.mil/pubs/pdf/DAT&L%20author%20guidelines_080528.pdf>*.

3 Number the pages in your manuscript and put your name on every page. It makes our life so much easier if we happen to drop a stack of papers and your article's among them.

4 Do avoid acronyms as far as possible, but if you must use them, define them—every single one, however obvious you think it is. We get testy if we have to keep going to *acronymfinder.com*, especially when we discover 10 equally applicable possibilities for one acronym.

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6 We'll acknowledge receipt of your submission within three or four days and e-mail you a publication decision in four to five weeks. No need to remind us. We really will. Scout's honor.



Managing Change During an ERP Implementation

Brittany C. Walsh

During war or peacetime, the mission of managing the Army's supply chain is the same: To provide the warfighter with the right item, at the right time, and at the right location. Currently, the Army is in the process of implementing one of the largest software system changes in

Walsh works at the Aviation and Missile Life Cycle Management Command as a logistics management specialist for the Integrated Materiel Management Center, co-located with the Apache helicopter project office.

its history. During the implementation of this new system, the mission of supporting the warfighter does not change. This article details how to ensure the transition from a legacy system to a new system doesn't impact the overall operational mission, using the Aviation and Missile Life Cycle Management Command (AMCOM)'s enterprise resource planning (ERP) experiences in implementing the Logistics Modernization Program as an example. Although the experiences detailed in this article are Army-specific, the lessons learned can be applied across the Department of Defense.

Background on the LMP

The Logistics Modernization Program is an ERP software solution based on a platform developed by SAP, a developer of enterprise software solutions. LMP leverages SAP's industry-leading ERP technology to address all business practices associated with moving goods from factory to foxhole. LMP fully supports sourcing and acquisition, production scheduling, order processing, inventory management, transportation, warehousing, and customer service. Today, U.S. troops in Afghanistan, Iraq, and other regions of the world reap the benefits of this technology. (For more information, see "LMP Makes Strides Toward Full Deployment" by Col. Scott Lambert, *Defense AT&L* January-February 2009.)

Army Materiel Command consists of several major subordinate commands, and one of those subordinate commands—the Communications and Electronics Life Cycle Management Command—has already implemented LMP. The technology will eventually be used throughout AMC to manage supply and maintenance data at the national level. AMCOM is AMC's second major subordinate command scheduled to deploy LMP, and with this deployment, the technology will also be implemented at Corpus Christi Army Depot, Texas, and Letterkenny Army Depot, Pa.

A project office will manage the process of change, which is vital in order to achieve the business objectives of the project.

LMP will replace two software systems—the Commodity Command Standard System and the Standard Depot System—in addition to smaller software programs in use at AMCOM, Corpus Christi Army Depot, and Letterkenny Army Depot. The Commodity Command Standard System is used at AMCOM to maintain and access supply data. The Standard Depot System is the legacy system used by AMC depots to manage data. During the AMCOM implementation, LMP will replace the current end-to-end processes for the wholesale supply and inventory management of helicopter and missile systems.

It is essential that supervisors understand the importance of their commitment to change management.

Top-Down versus Bottom-Up Change Management

The LMP implementation is not without risk. In their 2001 ERP implementation survey, Robbins-Gioia LLC found that 51 percent of companies with ERP implementations believed their implementations were unsuccessful. However, the surveyed companies that had a dedicated ERP project management office had only a 36 percent failure rate. If those statistics are an indicator of what makes an ERP implementation a success, the Army substantially increased the likelihood of LMP's success by establishing a project office within its program executive office for enterprise information systems.

A project office will manage the process of change, which is vital in order to achieve the business objectives of the project. Those in a project management office as well as managers and supervisors need to understand the importance of managing change from two perspectives: top-down and bottom-up.

Top-down change management is the traditional management paradigm in which all direction and authority flows from the uppermost managers down to everyone else and, unfortunately, is the only methodology many supervisors employ to manage change. The top-down approach manages change from above without close involvement from first-line supervisors and employees. That may result in higher failure rates because of low employee buy-in and a lack of flexibility and empowerment at lower levels of the organization.

In 1998, Spikes Cavell & Company conducted a survey for French computer company BULL. The survey included 203 telephone interviews with project and information

technology managers. Ninety-one percent of those surveyed believed that success required end-user commitment and that communication strategies were necessary to manage expectations. Although that is just one statistical example, the overall trend is that change management is most successful when supervisors actively engage employees in the change process through bottom-up change management techniques to manage expectations and secure end-user change commitment.

It is essential that supervisors understand the importance of their commitment to change management. Supervisors have immense influence on an employee's perception of change and of the new system. The first-line supervisor is an important source of information from upper management and will be in a position to communicate most directly with core system users.

Methods for Managing Change

The supervisor should begin managing change as soon as possible by doing an assessment of each employee's attitudes toward the change and an employee's knowledge of the new system. The assessments should be made throughout the change process to identify issues needing managerial attention and to measure the effectiveness of training.

Attitudes

During the ongoing assessment of each employee's attitudes and knowledge, the supervisor can communicate expectations in an individualized manner. Those personal one-on-one discussions allow the supervisor to provide feedback and mentor employees through the implementation.

While assessing attitudes, it is important to distinguish between genuine concerns and complaints from naysayers. The manager should use concerns as an opportunity to educate employees about the changes and their impact on the process. Supervisors need to minimize the effect of negative attitudes to ensure they do not harm morale or productivity in the office. It is best to address negative issues as early in the process of change as possible to manage challenges to organizational objectives and the success of the implementation.

It is important to remember that change can be challenging, and although it is inevitable, it is most effectively managed when the office works together towards a clearly articulated goal.

Knowledge

Pre-implementation LMP training is being delivered to users by expert trainers. Most of that training is function-specific and is determined based on role-mapping and job descriptions.

Continued on-the-job training will begin after the system goes live to train new employees and maintain/improve the skills of existing employees. Those training programs are within the supervisor's power to establish and control.

Existing training programs were designed to provide employees with the skills necessary to operate pre-LMP systems. With the introduction of LMP, existing on-the-job training processes and materials need to be revised.

The first step in managing office training is to evaluate what essential knowledge and skills employees need to perform their jobs. Next, supervisors need to find out what ongoing training classes will be available throughout the command. The analysis of knowledge and skills should include processes and systems that are seldom used by employees. After the gaps in knowledge are found, it will be necessary to decide who is qualified to conduct the training and how often it will be delivered.

Training can be conducted by either external or internal trainers. Supervisors may send employees to learn from external trainers. The instructors should be experts in the fields they teach and should be well-equipped to provide detailed explanations to system users. The use of external trainers can be very effective when used to expose employees to system-wide changes or to review skills and processes used infrequently.

Supervisors may also create in-house expertise by designating employees to receive extra training in specific areas of the system. Sending members to deepen their knowledge in strategic areas may take time away from the office in the short-term, but will benefit everyone in the long-term. By proactively adjusting workloads to allow

Fifty-one percent of companies with ERP implementations believed their implementations were unsuccessful. Companies with a dedicated ERP project management office had only a 36 percent failure rate.

Buying Green As the largest federal buyer of goods and services, the Department of Defense strives to ensure that every procurement meets the requirements of all applicable federal green purchasing requirements. In fiscal year 2004, DoD established a formal Green Procurement Program (GPP) to enhance and sustain mission readiness while protecting the environment through compliant, cost-effective acquisition that reduces consumption of resources and excessive generation of solid and hazardous wastes.

Environmentally preferable products

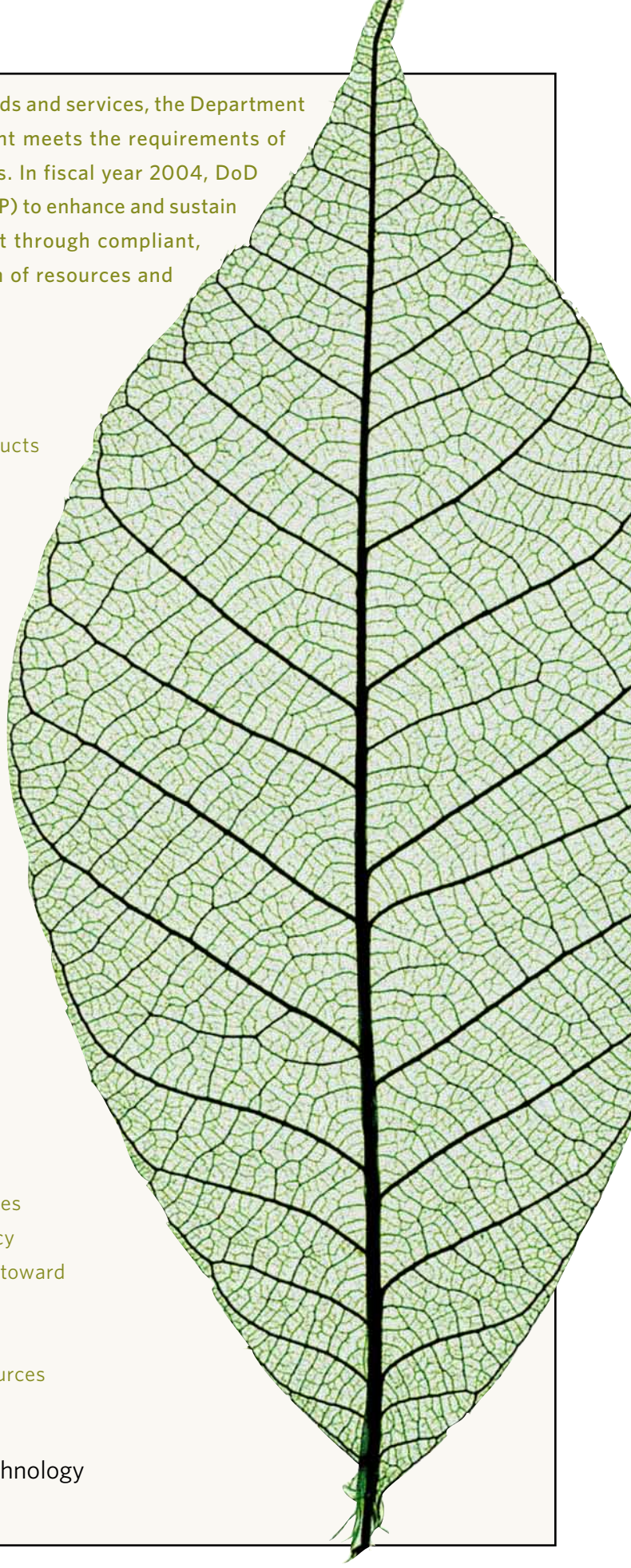
- Recycled content products
- Energy-efficient products & water-efficient products
- Alternative fuel and fuel efficiency
- Biobased products
- Non-ozone-depleting substances

Green Procurement

The objectives defined in DoD's GPP policy are to:

- Educate all appropriate DoD employees on the requirements for federal green procurement preference programs, their roles and responsibilities relevant to these programs and DoD's GPP, and opportunities to purchase green products and services
- Increase purchases of green products and services consistent with the demands of mission efficiency and cost-effectiveness, with continual progress toward federally established procurement goals
- Reduce the amount of solid waste generated
- Reduce consumption of energy and natural resources
- Expand markets for green products and services

For more information visit the Acquisition & Technology Web site at <*www.acq.osd.mil/at*>.



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individuals to get advanced training, the office will benefit from the knowledge brought back to the group. It's advised to keep the office aware of the available in-house expertise and to select in-house experts who will be willing to share their information. Additionally, all on-the-job office training materials should be periodically reviewed to ensure they remain up-to-date and relevant.

While deciding the best methods to manage office training requirements, the supervisor should keep in mind the number of employees requiring training, the availability of outside training through other programs such as internships, and individual training requirements.

Last-Minute Preparation

During the final stages of the implementation, as the go-live date nears, supervisors need to consider short-term actions to help everyone adjust. Supervisors should expect varying expertise in the office and may need to balance employee's duties or adjust workloads to ensure the completion of mission necessary tasks. That will be especially important when LMP initially goes live and the legacy system is turned off. Patience is strongly recommended, as some employees will learn and adjust faster than others.

Finally, all of the mentioned strategies will require management execution. It would be a mistake to assume that managing attitudes and training will automatically develop over time; supervisors must proactively manage change and not be distracted by the daily requirements of normal business.

Working Toward a Successful Project

AMCOM has reviewed previous successful ERPs, and by applying effective change management practices outlined in this article, the transition to LMP software will be done with relative ease and without loss of the mission. Utilizing the bottom-up perspective of change management during the LMP implementation will help create additional assurances of a successful project. The paradigm depends on keeping front-line supervisors informed and empowered to manage change with their employees. By considering the individual strengths of their employees and by managing the entire team, front-line supervisors are uniquely situated to solve the upfront workload burdens of a new system. By managing employee expectations through communication and education, it is possible to increase the chances of a successful system-wide change.

Above all, as AMCOM implements LMP, currently scheduled for May 9, 2009, it remains the duty and responsibility of all users of the new system to continue their day-to-day activities in support of the warfighter.

The author welcomes comments and questions and can be contacted at brittany.walsh@gmail.com.



Value Engineering Throughout a Defense System's Life Cycle

Danny Reed ■ *Jay Mandelbaum*

According to the May 1993 Office of Management and Budget circular A-131, value engineering (VE) is an organized/systematic approach directed at analyzing the function of systems, equipment, facilities, services, and supplies for the purpose of achieving their essential functions at the lowest life cycle

As a research staff member at the Institute for Defense Analyses, **Reed** *leads value engineering and reduction of total ownership cost initiatives for OSD. He previously worked 27 years on manufacturing development for the F-16 program at Lockheed Martin.* **Mandelbaum** *leads technology research in readiness assessments, quality assurance, and systems engineering initiatives for OSD as a research staff member at the Institute for Defense Analyses. He previously spent 30 years in the federal government.*

Figure 1. **Defense Acquisition Management Framework**

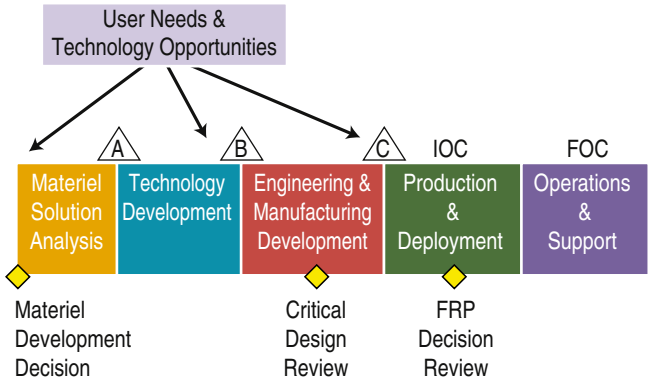
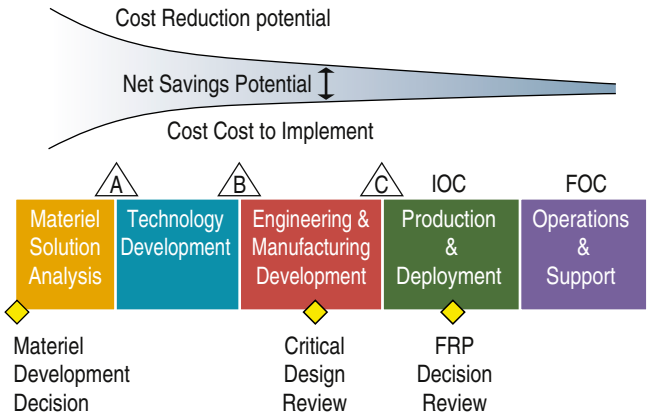


Figure 2. **VE Savings Potential During the Life of a Typical System. (Adapted from E. D. Heller, General Dynamics Corporation)**



cost consistent with required performance, reliability, quality, and safety.

The VE methodology consists of a distinct set of work elements that can be applied to any project. It is a vehicle to carry the project from inception to conclusion. By adhering to certain formalities, the VE methodology ensures that consideration is given to all necessary facets of the problem. The methodology involves an objective appraisal of functions performed by parts, components, products, equipment, procedures, services, and so on—anything that costs money. It is designed to create, analyze, and evaluate alternatives for eliminating or modifying any element that significantly contributes to the overall cost without adding commensurate value to the overall function. Specific recommendations are supported by necessary back-up data, implementing actions, a proposed implementation schedule, and a required follow-up procedure.

There is a relationship between the VE methodology and systems engineering. In the context of a Department of Defense acquisition, systems engineering provides a systematic set of processes to help coordinate and integrate activities throughout the life cycle of a system. Systems engineering offers a technical framework for conducting trades among system performance, risk, cost, and schedule.

The VE/systems engineering relationship is based on VE being an effective technique for making those trades in a way that not only reduces costs but also increases productivity and improves quality-related features of systems, equipment, facilities, services, and supplies. After all, VE is more than cost reduction. VE is a disciplined approach to examining costs and function from every conceivable angle. Cost reduction is just a management approach that focuses on developing cost awareness and cutting those costs. VE challenges all facets of the product or system based upon the function to be performed and identifies the lowest cost alternative that meets the requirements.

As such, DoD policy recognizes the VE methodology as a systems engineering tool for making a significant contribution toward greater economy in developing, acquiring, operating, and supporting the products necessary to fulfill its mission.

This article provides greater detail on the phases of the DoD acquisition process, the role of systems engineering within those phases, and the potential contributions the VE methodology can make to the systems engineering processes.

VE Opportunities During the Defense Acquisition Process

The Joint Capabilities Integration and Development System (JCIDS) supports the Joint Requirements Oversight Council (JROC) in identifying, assessing, and prioritizing joint military capability needs that may ultimately be met with a materiel solution obtained through the acquisition process. The Defense Acquisition Management Framework provides management principles, policy, and procedures for translating DoD mission needs and technological opportunities into system acquisition programs. It is characterized by five phases separated by three major milestone decision points, as depicted in Figure 1. The five phases are:

- Materiel solution analysis
- Technology development
- Engineering and manufacturing development
- Production and deployment
- Operations and support.

The three major milestone decision points are:

- Milestone A—authorizes the technology development phase
- Milestone B—typically a formal program initiation
- Milestone C—approves low-rate initial production.

The full-rate production decision is made after initial operational test and evaluation have been completed. Initial operational capability and full operational capability are achieved as the production units are fielded.

VE is more than cost reduction. VE is a disciplined approach to examining costs and function from every conceivable angle.

While value engineering is applicable at any point in the life cycle, Figure 2 illustrates that the savings potential usually decreases as the program ages. VE should be applied as early as possible in the life cycle. Early VE tends to produce greater savings (or cost avoidance) because at the critical design review, approximately 80 percent of the total costs are committed for typical programs. (Typically, only 20 percent of the costs are incurred.) Therefore, greater opportunities exist for change, and the changes cost less to implement before then.

Even if early opportunities are missed, VE can still be applied. Late in a program, VE is precluded only in those rare instances in which the cost of the VE effort and subsequent implementation would be greater than the savings potential. While later VE normally adds implementation costs and affects smaller quantities, such deterrents may be offset by improved performance and reliability and the savings generated from increased product life. Usually, there is some opportunity for net savings at any stage of a program.

DoD Directive 5000.1 encourages cost savings: "Acquisition programs shall be managed though the application of a systems engineering approach that optimizes total system performance and minimizes total ownership costs." The use of VE and the value methodology can make important contributions to the systems engineering process throughout the life cycle, although certain targets of opportunity may be useful in selecting an appropriate time to apply VE. Such targets of opportunity include situations in which:

- Current system performance or cost does not satisfy the customer
- Advances in technology have system application, resulting in enhanced performance or reduced cost
- The likely savings are high
- VE may be applied easily.

An important prerequisite for applying the VE methodology is properly establishing separate cost and income baselines and data collection practices, enabling more accurate tracking of savings during execution. The following sections describe VE opportunities early in the life cycle, during production and deployment, and during operations and support.

VE Early in the Life Cycle

The most opportune time to apply the VE methodology is early in the life cycle, before production begins, before field or technical manuals are drafted, and before logistic support plans are finalized. Although applications may be more challenging as compared to later in the life cycle, some of the more important benefits are:

- Savings can be applied to all production units.
- Reductions to the high cost of development, the subsequent cost of production, and the consequent costs related to operation and support may be realized.
- Fewer modifications to production lines, tooling, processes, and procedures will be required.
- Fewer drawing changes will be necessary.
- Fewer post-production changes to logistic and support elements such as manuals, maintenance facilities, and spare parts requirements will be needed.

The materiel solution analysis (MSA), technology development (TD), and engineering and manufacturing development (EMD) phases encompass the early part of the life cycle.

VE During Materiel Solution Analysis

MSA begins with the approval of an initial capabilities document, which identifies the needed capability. Alternative concepts for attaining the needed capability have also been developed, and a plan for an analysis of alternatives has been approved. The purposes of MSA are to refine the initial concepts so that a decision on the preferred materiel solution can be made, and to develop a technology development strategy for the preferred materiel solution. MSA presents the first substantial opportunity to influence system design by balancing technology opportunities, schedule constraints, funding availability, performance parameters, and operational requirements.

During MSA, systems engineering ideally provides top-level, iterative, and recursive analytical processes for each alternative materiel solution. Such application of the systems engineering processes can result in a technical evaluation of the operational effectiveness and estimated life cycle costs of the alternative materiel solutions that may provide a materiel solution to a needed mission capability. Tradeoffs among system operational requirements, operational utility, technology maturity, and life cycle costs can lead to a best system solution within allowed constraints. Effectively employing systems engineering will also support a preliminary assessment of the technical and management risk that will be considered in choosing the preferred materiel solution and formulating the technology development strategy.

In the recent past, systems engineering has not had a significant impact so early in the life cycle. Initiatives are under

VE contributes to systems engineering activities by devising alternative means for achieving required functions and developing alternative designs to meet functional needs.

way, however, both to tighten the linkages between the JCIDS process and the acquisition management process, and to begin acquisition-related technical planning earlier in the life cycle. For example:

- The JROC now requires a formal technical risk analysis.
- The Air Force is piloting the disciplined application of systems engineering during the development of concepts that feed an analysis of alternatives.

All such activities lead to a systems engineering plan at or near Milestone A. VE can have a significant role in support of the systems engineering plan during MSA. According to Emerson N. Wells in his article "Cost Effectiveness and Value Engineering: A Comparative Analysis," published in *SAVE International Annual Conference Proceedings* (1968), the analysis of alternatives and associated cost-effectiveness studies can use the VE methodology to analytically evaluate functions and provide a mechanism to analyze the essential requirements and develop possible alternatives offering improved value. In that context, detailed evaluations of the technical requirements of each alternative materiel solution can be made, and their effects on total performance can be determined. Concurrently, the effect on life cycle cost of each alternative being considered is estimated and related to the individual technical requirements. If areas of high cost and high-cost sensitivity are identified, the associated requirement may be examined in relation to its contribution to effectiveness. The requirements identified by those high-cost areas could be examined in detail from a cost-effectiveness standpoint. Based on the aforementioned efforts, the VE function may be used to do the following:

- Constructively challenge the stated needs and recommend alternatives
- Constructively challenge the desired mission performance envelopes to ensure they are necessary and most cost effective
- Ensure that user requirements are well-founded.

VE During Technology Development

A successful Milestone A decision initiates the TD phase. The phase reduces technology risk and determines the appropriate set of critical subsystem technologies to be integrated into a full system. It is a continuous technology discovery and development process that reflects close collaboration between the science and technology community, the user, and the developer. Technology development is an iterative process of assessing technologies and refining user performance parameters. At the end of the TD phase, all critical technologies should have been demonstrated in a relevant environment at the system, subsystem, or prototype level.

During technology development, systems engineering should provide comprehensive, iterative processes to mature the suite of technologies for the preferred materiel solution by:

- Converting critical capabilities into subsystem performance specifications
- Translating user-defined performance parameters into configured subsystems
- Integrating the technical inputs of the entire design team
- Managing interfaces
- Characterizing and managing technical risk
- Transitioning technology from the technology base into program-specific efforts
- Verifying that preliminary designs meet operational needs.

VE can be used to analyze the value of each requirement and the specifications derived from it by comparing function, cost, and worth. By critically examining the cost consequences of requirements and specifications, a VE study can generate answers to the following questions:

- Is the resultant cost effect of each requirement comparable to the worth gained?
- Is the resultant cost effect of the tolerance specified on each requirement comparable to the worth gained?
- Is the resultant cost effect upon the product comparable to the worth gained by the specification?
- Can the specification be tailored to minimize effort and cost?

Such efforts are, in effect, an early application of the principles of a cost as an independent variable (CAIV) analysis, which can help determine whether user requirements and specifications are well-founded and also lead to the relaxation or elimination of requirements/specifications.

VE During Engineering and Manufacturing Development

Formal program initiation usually occurs when the milestone decision authority approves entrance into the EMD phase. In that phase, the program, system architectures, and system elements down to the configuration item-level are defined based on the technology matured during the TD phase. System design requirements and the support concept are refined, and integration and manufacturing risks are reduced.

The EMD phase is divided into two parts: integrated system design, and system capability and manufacturing process demonstration (SCMPD). During integrated system design, systems engineering reduces program risk, identifies potential management issues, and guides design choices by allocating requirements at greater levels of detail. Through the use of systems engineering, the SCMPD effort demonstrates the system performance in its intended environment. Verification at each step confirms that specified requirements have been fulfilled. Validation at the end of the process confirms that the refined solution meets the needs of the user.

As part of the development and refinement of the functional architecture, VE should be used for:

- Identifying the necessary top-level functions for each of the missions considered
- Identifying technical approaches (i.e., design concept) to the missions
- Identifying necessary lower-level functions for each technical approach (the value engineer should place emphasis on eliminating unnecessary design restrictive requirements)
- Evaluating each function in terms of technical feasibility
- Estimating the cost of various functions.

An effective application of the VE methodology will include further analysis of the high-cost functions and the identification of alternative, less costly ways of achieving the same result. When programs view life cycle cost as an independent variable, it should be treated as equally important to performance and schedule in program decisions. Program managers are encouraged to develop a formal CAIV plan as part of their acquisition strategy, which is required at Milestone B. While the implementation steps in a CAIV plan will depend on the type of system and its current stage in the acquisition framework, two of the suggested elements—cost goals and trade-off studies—tie closely to VE. (See *Defense Acquisition Guidebook*, Section 3.2.4, "Cost As an Independent Variable.")

Cost Goals

The CAIV plan would include cost goals for unit production cost and operation and support costs. The unit production cost goal typically would be established for a specified quantity of systems and a specified peak production rate. The operation and support cost goal typically would be an annual cost per deployable unit (e.g., battalion or squadron) or individual system (e.g., ship or missile). The goals should be challenging but realistically achievable.

Tradeoff Studies

Cost, schedule, and performance may be traded off within the trade space between thresholds and objectives documented in the capability development document. Over time, as the system design matures, the trade studies become more refined and specialized.

As part of the definition and refinement of the physical architecture (design), VE should support the system engineering process by helping develop alternative ways of providing the required function with lower production and sustainment costs. The value engineer usually engages in such activities in high-leverage areas. Therefore, the VE process should first identify individual high-cost subsystems or items to stimulate early detection of unnecessary costs in time to take corrective action. Once those high-leverage areas have been determined, the next step is to shape and evaluate alternative designs in relation to the technical requirements, performance limits, subsystem interrelationships, logistics support requirements, and system cost and value. VE contributes to the logistics support analysis as it is used to establish maintenance plans and to ensure that the design process incorporates logistic requirements and cost considerations, including reliability, maintainability, spares, and obsolescence.

Common VE activities during engineering and manufacturing development are:

- Evaluating design concepts from a life cycle cost standpoint
- Eliminating unnecessary design-restrictive requirements established by the user or design community
- Achieving CAIV
- Meeting system requirements at the lowest life cycle cost from a logistics support analysis perspective
- Searching for new manufacturing processes or new materials to be used in the design
- Searching for problems encountered by others who attempted to design similar systems or components
- Defining interfaces between or among functional areas
- Conducting design trades.

During the SCMPD step, VE challenges the need for expenditures on data, number of prototypes, peculiar support equipment, and so on. Initial prototypes are evaluated to identify additional opportunities to improve value. VE efforts at this stage analyze how suppliers can help reduce costs, asking the following questions:

- Have suggestions been invited from prospective suppliers regarding possible value improvement from loosening specification requirements?

- Have all nonstandard parts been identified and approved?
- Can the use of each nonstandard part be adequately justified?
- Can a redesign replace a nonstandard part with a standard part?
- Are the standard circuits, standard components, and standard hardware the lowest cost items that will supply the minimum required characteristics?

Once models and prototypes are built, they must be verified to meet the requirements. VE also supports this testing process by:
- Identifying functions to be tested
- Challenging the need for certain tests based on the functions the tests are designed to serve
- Challenging the tolerances of the tests specified based on the functions the tests are designed to serve
- Determining cost-effective ways to test them.

Finally, as a result of the testing experience, the VE process should look for opportunities to simplify the design for operational use—make the system easier to operate and maintain. Once production begins and the system is fielded, it becomes much more expensive to make these kinds of changes.

VE During Production and Deployment

The production and deployment phase begins at Milestone C. During that phase, the system achieves operational capability to satisfy mission needs. As the integrated components develop into a system, the test and evaluation processes frequently reveal issues that require system improvements or redesign. When the testing environment more closely resembles actual field conditions, the required improvements might be complex and subtle. The initial manufacturing process may also reveal unanticipated problems that may be resolved by changing the product somewhat. Low-rate initial production should result in completion of manufacturing development. Full-rate production delivers the fully funded quantity of systems and supporting materiel and services for the program or increment.

Systems engineering in the production and deployment phase is primarily concerned with analyzing known deficiencies and determining corrective actions. A plan to build, modify, verify, and test the proposed solution is also formulated and approved. The proposed solution to the deficiency is translated to the appropriate hardware, software, or specification changes. Modifications are created, incorporated, and verified in accordance with the approved plan. This product change may include retrofit, since the production process has begun. The impact on system cost, schedules, and performance should also be considered when addressing production incorporation.

VE contributes to these systems engineering activities by devising alternative means for achieving required functions and developing alternative designs to meet functional needs. VE has been extensively applied to evaluate and improve manufacturing processes, methods, and materials, including support equipment, technical data, and facilities, as well as the supply, transportation and handling, maintenance, and training functions. VE projects can be undertaken under certain circumstances:
- Recent developments indicate a potential opportunity for cost reduction
- The future use of the item depends on significant reduction in production costs
- New manufacturing technology and new materials become available.

In addition, as production becomes more mature, VE may support the decision to eliminate quality assurance testing, which often cannot be proposed until considerable experience is acquired and data gathered to prove that it is feasible. VE may also reveal that management reports required to understand a complex situation early in production may turn out to be unnecessary after more experience is gained.

VE During Operations and Support

During the operations and support phase of the acquisition framework, system support is provided to satisfy operational requirements and sustainment needs in the most cost-effective manner over the life cycle. Usage data are collected and analyzed to determine the root cause of any problems encountered. After a risk assessment is conducted, corrective actions are formulated.

In this phase, systems engineering processes support in-service reviews; trade studies; and decisions made about modifications, upgrades, and future increments of the system. Interoperability or technology improvements, parts or manufacturing obsolescence, aging issues, premature failures, changes in fuel or lubricants, joint or service commonality, and so on, may all indicate the need for system upgrade. System disposal is not a systems engineering activity, but systems engineering processes that inject disposal requirements and considerations into the earlier design processes ultimately affect disposal.

After fielding, opportunities for VE may exist for a long time. Product life cycles are being extended; for consumables, there is no sure way to determine the total quantity that will be purchased. Also, in the past, many items that entered the defense inventory were never subjected to a VE analysis. The potential for VE savings on these items is real. Advances in technology or changes in user requirements provide a basis for potential savings.

After a system or item is fielded, changes are often expensive to implement. However, large potential savings

to operation, maintenance, and other logistics functions might justify the investment. Using VE principles supports the development, evaluation, and implementation of such changes within the overall systems engineering process. Within the Defense Department, the following process has been proven to be a successful context for VE:

- Establish cost consciousness in the program
- Establish a cost baseline and identify cost drivers
- Develop a cost-reduction strategy
- Manage cost within the program
- Establish cost goals, objective, and threshold
- Establish meaningful cost-reduction metrics
- Identify and quantify cost-reduction initiatives
- Track implementation of cost-reduction projects
- Measure results against the plan.

VE contributes to every aspect of that process; it is especially suited to the identification and evaluation of cost-reduction initiatives. The evaluation function is extremely important because such initiatives typically include an up-front investment that will be recouped over time.

VE has been used to formulate initiatives to:

- Extend item life by applying state-of-the-art designs, materials, or processes
- Reduce repair costs by achieving the repair function in a more economical manner
- Reduce packaging costs by improving packaging procedures or materials
- Remanufacture and replace legacy systems
- Improve reliability and maintainability
- Use commercial processes, technologies, and commercial off-the-shelf items to reduce cost and improve reliability
- Replace aging engines and engine parts
- Improve supply-chain response time and reduce logistics footprint using direct vendor delivery, commercial maintenance agreements, and virtual prime vendor support
- Initiate reliability-centered maintenance and condition-based maintenance to reduce preventive maintenance costs without affecting corrective maintenance needs
- Reduce the number of people required to operate and maintain by improving usability and maintainability
- Eliminate sole-source procurement.

Seek VE Opportunities

A detailed understanding of the acquisition management framework is not a prerequisite for applying VE. It is presented here to describe when VE should be applied throughout a system's life cycle and to emphasize that the earlier VE is applied, the greater the potential for savings. The VE activities described in this article sometimes take place without using the formal VE discipline. Unfortunately, such informality is often accompanied by uneven or mediocre efforts, especially early in the life cycle, where less data are available. That has led, in part, to a common misconception that VE applies only to production contracts. This article describes many potential VE applications during development. The systems engineering process encouraged tradeoffs among cost, schedule, and performance represent excellent but often missed opportunities for applying VE. It is important to aggressively seek areas to apply VE in these more challenging situations.

Finally, in today's acquisition environment, many systems remain in inventory for a long time because of major modifications or upgrades (e.g., block changes or preplanned product improvements). Therefore, opportunities for large VE savings extend much later into the life cycle. Once again, such opportunities may be missed because of the strong association between VE and production. DoD cannot afford to ignore them in the future.

Note: This article is adapted from the authors' paper, Value Engineering Handbook, *published by the Institute for Defense Analyses (IDA) in September 2006. The paper was based on information in Army Pamphlet 11-3, "Value Engineering" (undated), and DoD Handbook 4245.8-H, "Value Engineering," March 1986. The IDA paper is available at <http://ve.ida.org>, and information for this article is used with the permission of IDA.*

For further information, please see:

OMB Circular A-131, "Value Engineering"
<*http://georgewbush-whitehouse.archives.gov/omb/circulars/a131/a131.html*>

Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01F Joint Capabilities Integration and Development System
<*https://acc.dau.mil/communitybrowser.aspx?id=152771&lang=en-US*>

DoD Directive 5000.01, "The Defense Acquisition System"
<*https://acc.dau.mil/communitybrowser.aspx?id=54706*>

DoD Instruction 5000.02, "Operation of the Defense Acquisition System"
<*https://acc.dau.mil/communitybrowser.aspx?id=44891*>

Defense Acquisition Guidebook
<*https://akss.dau.mil/dag/*>

The authors welcome comments and questions and can be contacted at dreed@ida.org and jmandelb@ida.org.

Focusing Sustainment Logistics Toward Capabilities Development: Part II

Charles Borsch



Part I of this article, published in the May-June 2009 issue of *Defense AT&L* magazine, recommended that life cycle logisticians press to establish more persistent and thorough analyses of fielded defense system sustainment performance and associated operations and support (O&S) costs. Operational logistics analyses, fed consistently into the earliest phases of acquisition by means of stronger business case decision rationale, can affect systems life cycle decisions and management; and they can specifically further a long-standing intent that all early decisions better target logistics supportability that will most affordably sustain systems' technical performance to persistently high degrees of operational availability. While such analyses could be used to greater effect by logistics advocates during the earliest capabilities-determination phases of acquisition, timely analysis is, unfortunately, not routinely cycling back to serve logistics advocacy in driving early-phase systems acquisition.

Borsch *serves as the deputy of the acquisition logistics and strategy branch, Office of Deputy Chief of Naval Operations for Fleet Readiness and Logistics.*

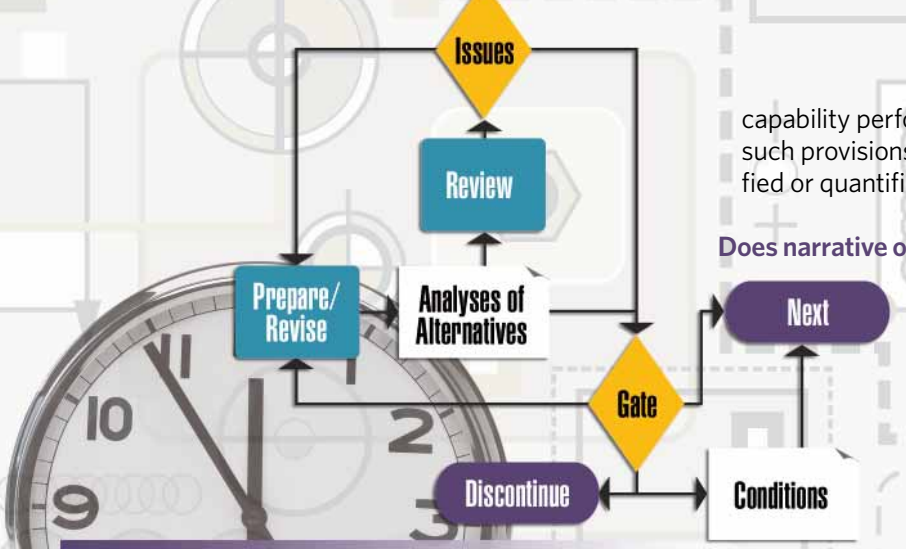


Part II describes the use and leverage of "brought-forward" sustainment analyses to affect major acquisition decisions at each new program review and decision venues of the Department of Navy: the six Gate Reviews. Gate Reviews—also known as Phase-Gate Reviews—are assessments held at critical points of a system development process to reduce risk early and determine the advisability of continuing development. Details on Gate Reviews are provided at the end of Part I. Those Gate-by-Gate benchmarks reflect logistician opportunity to exert a consistent advocacy for decisions that may best lead to optimally affordable life cycle systems sustainment.

Gate 1 Benchmarks

Gate 1 addresses new defense system feasibility in view of the evolving warfighting need; adequacy of the performance capabilities that presently meet those needs; and opportunities presented by evolving technology. The decision sought is approval of a Joint Capabilities Integration Development System process interim capability document. The JCIDS ICD sets conditions for comprehensive and testable system technical performance parameters, including technical performance related to system reliability, availability, and maintainability (RAM); and diagnostic/prognostic capabilities. At this stage, there is functional assessment of warfighting needs, but no materiel solution is set. Gate 1 decisions authorize an initial analysis of alternatives (AoA) to find such materiel solutions for emerging performance capability needs.

Logisticians must critique and contribute to the warfare sponsor's functional needs reports, draft an ICD, and draft Gate 1 briefings, keeping in mind the following questions:



Gate-by-Gate benchmarks reflect logistician opportunity to exert a consistent advocacy for decisions that may best lead to optimally affordable life cycle systems sustainment.

Does narrative on warfighting capability needs address all systems performance categories projected for the operational environment? Logisticians must ensure notional RAM performance discussion relates to all other systems' technical performance, since sustainment performance effectiveness will be central to any fielded system's overall operational effectiveness.

Do the ICD and Gate Review briefing narratives express unwarranted presumptions as to logistics support strategy or levels of maintenance? Gate 1 is too early for definitive statements regarding a particular logistics- or maintenance-level strategy for prospective defense systems. The ICD should instead describe the logistics strategy and sustainment infrastructure in use for existing system or systems that are to be replaced or upgraded—that is, starting-point factors only. To determine if presumptions about a sustainment strategy are moving too far ahead at Gate 1 and in the ICD, put sustainment into this context:

- System logistics and maintenance strategies are ultimately a program management prerogative. To discuss as a certainty that a particular strategy is locked in at this pre-Milestone B/ICD stage could constrain forming public/private partnerships made for the sake of logistics infrastructure efficiencies and economies of scale.
- Challenge directive provisions that there shall be no increase to manpower, facilities, training, maintenance levels, or support equipment. Such definitive statements tend to carry over as unchallenged into subsequent JCIDS capability development documents (CDDs) and capability performance documents (CPDs), where such provisions should instead be technically specified or quantified.

Does narrative on operational scenarios and warfighting performance capability clearly point to subsequent JCIDS CDD supportability-related performance capabilities development parameters? For example, if "persistent presence" is a stated need or if highly autonomous operations are anticipated, then the ICD and Gate Review should both outline a system to be developed (or procured) that exhibits high inherent reliability and maintainability plus advanced self-diagnostics.

Do the ICD and Gate 1 briefs set terms for the subsequent AoA, to include all functional performance categories that will later be expressed as CDD/CPD key performance parameter and key systems attribute terms? Department of the Navy and DoD policy require that sustainment-related KPPs and KSAs be specified: They are "Materiel Availability" KPP; and two KSAs, "Materiel Readiness" and "Ownership Cost." ICD narrative and the Gate I briefings must direct the AoA to assess those parameters for each viable alternative. The AoA should take no shortcuts in any category of technical performance capability, just as the ICDs make no strong presumptions as to logistics and maintenance strategies.

The post-Gate 1 AoA begins to project total program life cycle cost. AoA assessments should anticipate the pending CDD Ownership Cost KSA specification range and baseline each viable alternative, specifically in terms of known legacy system O&S cost and affordability analyses that logisticians can help make available. The view to take is that warfighting capability should be designed, developed, and acquired in stronger consideration of the extent to which resultant AoA CDD technical parameters can affordably be sustained to their minimum mandatory (threshold) levels of performance.

Once it has been determined that collective system performance capabilities are to be logistically sustainable to a certain level of operational or materiel availability, AoA findings should not presume a fixed degree of future logistics support funding, or that future funding of logistics will be sufficient only to sustain systems performance at some lesser degrees of availability than the CDD-specified threshold value. In other words, the AoA should not anticipate historical operational funding, but should assess cost to formally specified JCIDS parameter threshold values.

If warfighting capabilities are to replace or upgrade an existing defense system, the logistics and maintenance infrastructure that now sustains the existing systems must provide to the AoA a timely analysis of RAM readiness and associated ownership costs. Life cycle logisticians can ensure that the AoA then uses the data to project a life cycle cost perspective for each materiel alternative presented for subsequent Gate Review consideration.

Gate 1 directs minimum standards for AoA analysis team composition and expertise to assess all facets of technical performance. The assessment must include sustainment performance and O&S cost expertise, so that added facets of life cycle system performance, readiness, and cost are more accurately projected.

Gates 2 and 3 Benchmarks

Gate 2 and Gate 3 reviews are crucial from the perspective of supportability-related performance capability parameter specifications. They occur just before and after the acquisition Milestone A decision point that divides concept assessments and technology development. JCIDS CDD performance capability design and development criteria are set at Gates 2 and 3, by which point operational needs clearly target a materiel solution defense system. Few factors will affect that defense system's life cycle sustainment effectiveness and affordability as strongly as the effectiveness of logistics advocacy during this timeframe.

Logistics effort here is successful if JCIDS CDD supportability and ownership cost capability performance parameters are established among KPP/KSA subset priorities, and if parameter threshold design values were set based upon an analysis of support system performance and ownership costs of pertinent current systems.

When Gate 2 and 3 decisions establish KPP/KSA priority for support and sustainment-related performance capabilities among new systems, that same high (KPP/KSA) systems development prioritization should extend throughout the remainder of the program's life cycle development, specifically into subsequent JCIDS CPDs and major upgrades that may evolve from the initial program. Such a total system/life cycle management precedent will either help or hinder all subsequent logistician planning and execution, making Gates 2 and 3 critical logistician decision points. As a continuation of Gate 1, logisticians at Gates 2 and 3 must address the following issues:

Ensure that RAM performance parameters and threshold values are quantified to an analytic rigor of substantiation on a par with all other system technical performance capability parameters. In terms of JCIDS supportability performance specification, Gates 2 and 3 output should reflect a cohesive approach among program sponsors and offices responsible for life cycle logistics and for O&S phase resource sponsorship. For example, since 2004, it has been SECNAV 5000-series policy that program sponsors must assume a default consideration for specifying a "supportability" KPP, with concurrence required by the office of life cycle logistics, fleet/ashore readiness, and O&S phase resource sponsorship. The policy works because life cycle sustainment advocates and the O&S resource sponsor fully understand the consequences of Gates 2 and 3 events and act to exert a principal Gate Review role.

Still needed is more consistent sustainment analysis applied to more persuasive business case rationale and specifying a more quantitative set of design/development threshold values for supportability performance capability parameters. To make such stronger Gates 2 and 3 business cases, Services' readiness and cost analysis activities should be targeted to this purpose. System commands and other activities can serve more timely and influential roles by unpinning, in this manner, the major Gates 2 and 3 phase decisions that shape the inherent supportability of the systems they will eventually have to logistically support.

Briefings present a program health and risk assessment, with a subset of sustainability. Ensure that the assessment of sustainability risk is not principally based on operational availability (Ao) or materiel availability (MA). Sustainability risk at the Gates 2 and 3 stages should be based on performance that comprises inherent availability (the materiel readiness KSA plus maintainability). Mean down time and Ao/MA performance are not quantifiable or ongoing at this stage and will be subject to many future variables. They should not be strong factors here in sustainability risk calculation. Another reason is that sustainment phase effort can mitigate inherently poor or slow-to-mature RAM performance after initial operating capability (IOC). This is a conditional factor that should not be allowed to factor into program heath/risk determination. Lesser emphasis at this point on Ao/MA as an initial health assessment factor—in favor of inherent R&M—will not diminish sponsor responsibility for setting realistic and challenging RAM performance criteria. Sponsors must, regardless, convey RAM criteria (along with high-decision weight priority and sufficient resources) to program management for development. Keeping technical sustainment as a focus restricts a too-early reliance on later-occurring factors (Ao/MA/mean down time) to mitigate initial poor emphasis on RAM performance development.

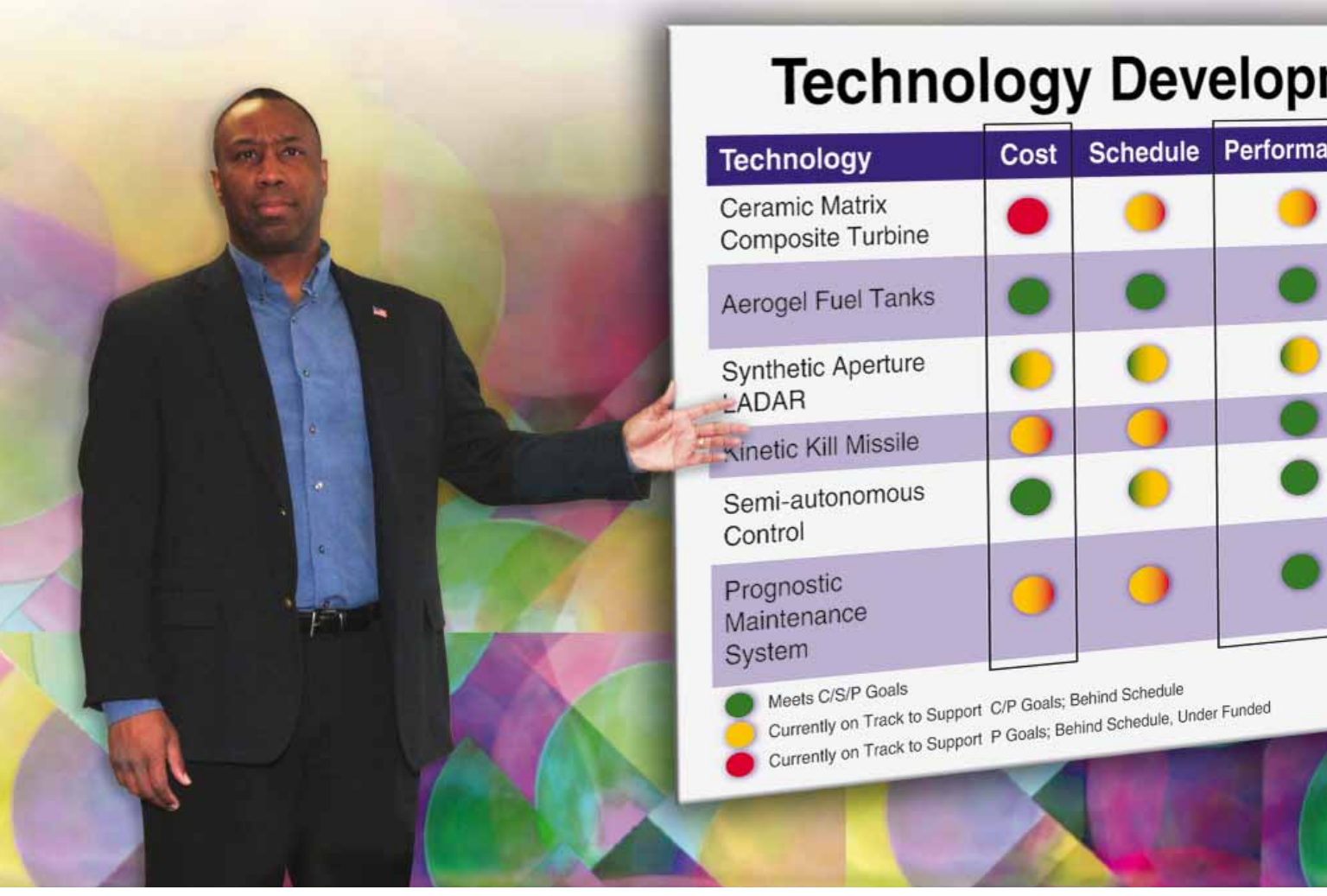
The prior two benchmarks deal with the technical and quantified aspects of Gate 2 and 3 program briefings and the draft CDD. Logisticians must now assess in detail the narratives for a specific logistics supportability strategy.

- While draft CDDs may discuss logistics support strategies, and even detailed individual integrated logistics

Focusing Sustainment Logistics *continued on page 68*

Revamping the Science and Technology Management Career Field

Martin Falk • Randy Zittel



Delivering superior technology to the warfighter effectively and efficiently is crucial to maintaining U.S. military forces' operational advantage. All too often, however, technology has been developed but hasn't transitioned across what is referred to as "the valley of death," which is the gap between developing technology and having it used in acquisition programs of record. The gap between acquisition program managers and technologists results partially from the separate prioritization and management processes involved with both parties. Bridging that gap requires technology managers to obtain a better understanding of the formal DoD acquisition management system and management principles instrumental to transitioning technology. Such an understanding must come from a combination of education, experience, and training. In the past, understanding acquisition management and management principles was difficult to achieve because the science and technology community throughout DoD was not initially recognized as a separate career field in the acquisition workforce. As a result, scientists and engineers

Falk *is the STM program learning director for STM and FIPT chair.* **Zittel** *is the Advanced STM course manager.*



Army Lt. Col. Robert Dutchie presents an STM 303 team's analysis and management of the project in the student pilot as well as a team's contracting strategy, which shows the contracting strategy, the acquisition program manager's agreed-to exit criteria, and funding issues. STM 303 allows students to discuss and learn about management issues rather than just the technological issues.
DAU Photo by SSgt. Andre Reynolds, USA

frequently did not receive the technology project management training they needed.

A Brief History of the Science and Technology Management Career Field

In 2002, the decision was made to establish a career field for science and technology managers as an addition to the existing acquisition workforce career fields. The objective of the career field, as explained in DoD Directive 5000.52-M, "Defense Acquisition Career Development Program," is to train the DoD science and technology community to better "lead, organize, and/or manage science and technology activities, including basic research, applied research, and/or advanced technology development."

The science and technology management programs are, for the most part, planned and executed by the Services' laboratories; Army Research, Development, and Engineering Centers; Navy Warfare Centers; Air Force Research Laboratory's divisions around the country; and DoD agencies. The Office of the Director of Defense Research and Engineering (DDR&E) has the DoD-wide responsibility to provide overall management and guidance for the defense science and technology programs. That includes responsibility for

leading the science and technology management functional integrated product team, which is responsible for establishing the certification requirements for the Science and Technology Management career field.

When the career field was initially established, there were no level I or level II certification requirements. To obtain level III certification, professionals were required to have two years of science and technology experience and take the level III science and technology management course. In time, a level II certification program was added, and it consisted of taking Fundamentals of Systems Acquisition Management (ACQ 101) and a level II science and technology management course.

By early 2008, there was a growing recognition by the members of the science and technology manager functional integrated project team that it was time to revisit the competencies, training, and certification requirements for science and technology managers. That decision was made as the result of feedback from students and the growing feeling among FIPT members that the requirements were not sufficiently rigorous, especially in comparison to other career fields. The level I requirements were added to allow certification for entry-level people.

"The AT&L team must continue the legacy we have inherited—a legacy of providing unmatched weapons technology that has assured the security and freedom of our nation."

John Young, under secretary of defense for acquisition, technology and logistics

Competencies Revised

Subsequently, in the spring of 2008, the science and technology manager FIPT convened a special workshop with subject matter representatives from DDR&E, military services' science and technology offices, the Defense Threat Reduction Agency, the National Geospatial-Intelligence Agency, and the Defense Advanced Research Projects Agency. The group reviewed and updated the competencies deemed essential for people in the science and technology management career field to succeed in developing, managing, and transitioning technology. The result was a set of 47 competencies in areas such as technology transition, intellectual property, technology security, systems engineering, financial management, program management, and contracting. From that guidance, the Defense Acquisition University developed learning objectives that led to the new course structure and format for the level II and level III courses. The FIPT recommended, and the DDR&E director of plans and programs and the functional leader for the Science and Technology Management career field (Al Shaffer) approved the new competencies, the new course structure, and new certification requirements in June 2008. The goal was to have everything in place by the first quarter of fiscal year 2009.

Courses Revised

The next step was for DAU to develop the two entirely new courses. The Intermediate Science and Technology Management Course (STM 202), which replaced the old intermediate-level course (STM 201), provides a three-day learning environment dealing with the science and technology big picture, external influential organizations, individual Service and agency processes, technical and manufacturing readiness levels, and technology transition agreements spread across exercises and interactive discussion. Half of the STM 201 material was eliminated by relying on added prerequisites to cover the material. Some material, such as systems engineering, was moved from the 300-level course to the STM 201 course.

The heart of the new course is a series of lessons on technical, business, and transition planning and execution. At the start of the course, attendees develop their initial ideas on what they feel are the keys to successful technology transition. By the end of the course, those initial ideas have been discussed and challenged throughout the class, and the final lesson gives the students an opportunity to discuss how their views of the keys to successful technology transition may have changed. Through this intense activity, attendees see how the necessary continuum of science and technology transitioning into acquisition should flow and how to make that happen.

The Advanced Science and Technology Management Course (STM 303), which replaced the old advanced-level course (STM 302), immerses attendees in 3.5 continuous days of self-learning involving three roleplay exercises that provide exposure to the many issues a science and technology manager must address in the initiation, continuous planning, and ultimately, the successful transition of technology to a receiving and approving acquisition program manager.

Through this immersion in the varied project management issues, science and technology personnel work the procedures to more effectively have the technology developed to explicit criteria that the program manager needs to effectively integrate into a larger system. STM 303 differs from its predecessor in that there is very little lecture. Most of the lecture material was moved to STM 202 or is now covered in the added prerequisites.

Both STM 202 and STM 303 were delivered as scheduled. The level II student pilot was held at Fort Detrick, Md., in November 2008, and the level III student pilot was held at Fort Belvoir, Va., in December 2008. Information and schedules for future offerings of the courses are available at <www.dau.mil/schedules/schedule.asp>.

Certification Requirements Expanded

In addition to replacing the existing STM courses with new ones, the certification requirements were revised to require additional training and experience. Science and Technology Management certification now completely achieves three Defense Acquisition Workforce Improvement Act levels, providing fundamental, intermediate, and advanced level of requirements. Level I was added in 2009 to provide a certification opportunity for entry-level people, and the new level ensures professionals obtain a fundamental understanding of the acquisition process and the supporting systems engineering technical processes. Level I training consists of ACQ 101 and Fundamentals of Systems Planning, Research, Development, and Engineering (SYS 101). Level II training was revised and now consists of the online portion of the Intermediate Systems Acquisition Course (ACQ 201A), STM 202, and a continuous learning module on technology readiness assessments. Level III training consists of STM 303 and a continuous learning module on IPT management and leadership. The level III experience requirement was also raised from two years to four years. The requirement to take a continuous learning module titled "Introduction to DoD S&T" will be added for fiscal year 2010, and the module will be available the summer of 2009.

In 2002, the decision was made to establish a career field for science and technology managers.

STM Certification Requirements

Level I
- ACQ 101, Fundamentals of Systems Acquisition Management
- SYS 101, Fundamentals of SPRDE (online)
- CLM, Introduction to S&T (Under development)

Level II
- ACQ 201A, Intermediate Systems Acquisition
- STM 202, Intermediate S&T Management
- CLE 021, Technology Readiness Assessments

Level III
- STM 303, Advanced S&T Management
- CLM 014, IPT Management and Leadership

Science and Technology Management Future

DoD is breaking new ground by raising the bar for certification in the Science and Technology Management career path. Successful completion of the requirements will demand more in-depth training and better preparation by the student before attending in-residence courses. The end result should be a better prepared science and technology workforce able to:

- Conduct technology development and transition planning upfront and continuously through a technology project's life cycle
- Employ improved leadership across DoD science and technology programs
- Steward effective execution and transition of DoD science and technology programs.

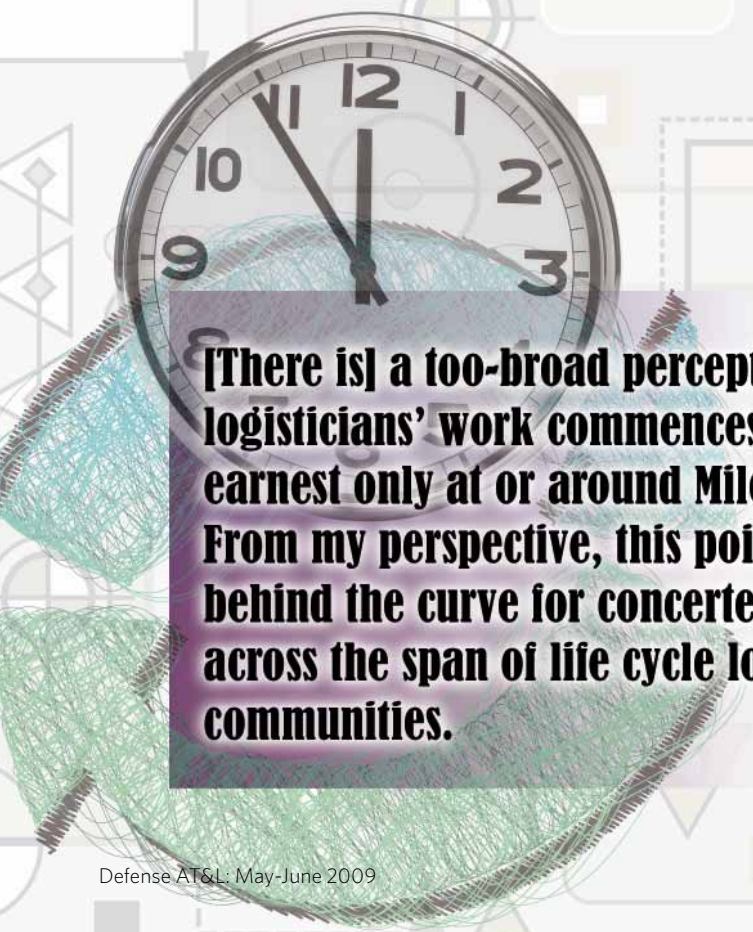
The authors welcome comments and questions and can be contacted at martin.falk@dau.mil and randy.zittel@dau.mil.

Focusing Sustainment Logistics *continued from page 63*

support elements, content should primarily advise in terms of overarching, outcome-based life cycle support strategy.

- It is not important here to express how many units or end items may be operational by the initial operating capability and full operating capability dates. It is more important to propose how a logistics support strategy will sustain all program CDD KPP/KSA capability parameters (not just RAM) to their specified threshold performance levels, beginning at IOC.
- If the IOC date falls within the timeframe of the current or projected budget, are sustainment planning and resources sufficient by that milestone to sustain every CDD KPP parameter to its individual threshold value level of performance?
- Is the support strategy clearly an integral part of evolving systems engineering plans; and is it apparent that supportability performance growth will be progressively tested to and throughout operational test and evaluation? It is not enough to ensure that supportability-related technical performance criteria are specified at these Gates. Supportability performance engineering and subsequent testing are inherent to evolving program life cycle management (and related strategic documents.)

Gates 2 and 3 are critical because they lead very quickly to program approval and initiation, especially when there is also a high operational priority that new performance capabilities be rapidly developed and deployed.



[There is] a too-broad perception that logisticians' work commences in earnest only at or around Milestone B. From my perspective, this point is well behind the curve for concerted work across the span of life cycle logistics communities.

Gates 4, 5, and 6 Benchmarks

At these stages, performance capabilities are established and systems engineering and acquisition strategies are advancing toward formal program initiation. The Milestone B decisions fall notionally between Gate 4 (design specification approval) and Gate 5 (approved solicitation request for proposal). A request for proposal will have included a call for logistics support execution that is performance-based and pegged to the sustainment-related performance parameters and KPP/KSA prioritization that logisticians helped establish during earlier Gate 2 and 3 decisions.

Central to an approach to post-Milestone B Gate Reviews is insistence that all major program decisions now be based on the predictable effects of system life cycle sustainment effectiveness and corresponding ownership cost affordability. As detailed sustainment plans form during these later Gate Reviews, there is increasing opportunity (given logistician visibility) to assess any impact that the individual program under consideration may have on the ability of the broader logistics support infrastructure to sustain readiness at optimal affordability.

As a rule, briefings of sustainment program health at all later Gate Reviews should be viewed as relatively high until continuity of sustainment results from earlier acquisition phases and Gate Review effort is demonstrated. Given the increasingly specific programmatic details in place by these later Gate Reviews, only a few general caveats are needed:

- Do independent cost estimates fully factor the life cycle cost of sustaining RAM parameter capabilities to their specified threshold levels of performance, and are those costs included in future years' programming?
- Do the same or similar metrics used for the predecessor system or systems show that development is progressing towards some percentage improvement in benchmark sustainment and O&S cost affordability?
- Do briefings of evolving logistics program adequacy exactly coincide with the findings of Service-independent logistics assessments?

This two-part article has focused on opportunities taken (or lost) during the earliest phases of acquisition. Sustainment/O&S phase logistics is addressed only to recommend uses for the sustainment analysis that can be brought forward into earliest-phase activities. I hope to counter a too-broad perception that logisticians' work commences in earnest only at or around Milestone B. From my perspective, this point is well behind the curve for concerted work across the span of life cycle logistics communities.

The author welcomes comments and questions and can be contacted at charles.borsch@navy.mil.

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Obama Nominates Defense Acquisition Under Secretary

Donna Miles
AMERICAN FORCES PRESS SERVICE (FEB. 24, 2009)

WASHINGTON—President Barack Obama announced yesterday that he will nominate Ashton Carter to be the next under secretary of defense for acquisition, technology and logistics. Carter is the chairman of the International and Global Affairs faculty at Harvard University's John F. Kennedy School of Government. He served as assistant secretary of defense for International Security Policy from 1993 to 1996.

If confirmed to the post held by John Young since 2007, Carter would oversee a sweeping defense acquisition reform effort.

Defense Secretary Robert M. Gates has called overhauling the way the department buys goods and services and manages taxpayer dollars one of the biggest challenges it faces.

"A risk-averse culture, a litigious process, parochial interests, excessive and changing requirements, budget churn and instability, and sometimes adversarial relationships" within the department and other parts of government have made acquisition reform a priority, Gates said last month during a Senate Armed Services Committee hearing.

If confirmed as under secretary, Carter would be the point man in the difficult procurement decisions Gates told the senators would begin with Obama's fiscal 2010 defense budget request.

"One thing we have known for many months is that the spigot of defense spending that opened on 9/11 is closing," Gates said at the hearing. "Two major campaigns ongoing, the economic crisis, and resulting budget pressures will force hard choices on this department."

Carter, who has a doctorate in physics, directed military planning during the 1994 crisis over North Korea's nuclear weapons program, according to a statement released by the White House. He was instrumental in removing all nuclear weapons from Ukraine, Kazakhstan, and Belarus; and he directed the establishment of defense and intelligence relationships with former Soviet nations at the end of the Cold War.

He also participated in negotiations that led to the deployment of Russian troops as part of the Bosnia Peace Plan Implementation Force.

Carter managed the Cooperative Threat Reduction program aimed at eliminating nuclear, chemical, and biological weapons of the former Soviet Union; and he directed the Nuclear Posture Review and oversaw the Defense Department's Counterproliferation Initiative. He also directed the reform of the department's national security export controls.

In 1997, Carter co-chaired the Catastrophic Terrorism Study Group with former CIA Director John M. Deutch, urging greater attention to the terrorist threat. From 1998 to 2000, he was deputy to former Defense Secretary William J. Perry in the North Korea Policy Review, and traveled with Perry to Pyongyang. From 2001 to 2002, he served on the National Academy of Sciences Committee on Science and Technology for Countering Terrorism and advised on the creation of the Homeland Security Department.

Carter is a two-time recipient of the Department of Defense Distinguished Service Medal, the department's highest award. In addition to his current position at the Kennedy School, Carter is co-director of the Preventive Defense Project, serving along with Perry. The project is a research collaboration between Harvard and Stanford universities.

Opportunities for DoD Civilians to Serve Worldwide (Feb. 3, 2009)

The Office of the Deputy Under Secretary of Defense (Civilian Personnel Policy) has been designated by Under Secretary of Defense for Personnel and Readiness as the lead in expanding the opportunities for Department of Defense civilians to fill global expeditionary augmentation requirements. These details are on Joint Task Force Headquarters staffs supporting operations in Iraq, Afghanistan, and other locations worldwide. More information is available online at <www.cpms.osd.mil/expeditionary>.

From the Office of the Director, Defense Procurement, Acquisition Policy & Strategic Sourcing (Jan. 2, 2009)

The Under Secretary of Defense for Acquisition, Technology and Logistics has co-signed a memorandum identifying Defense Acquisition shortage category positions, and delegating the authority to the military departments and defense agencies to appoint highly qualified individuals to these positions. Read the entire memorandum at <www.acq.osd.mil/dpap/ops/docs/expeditedhiringauthority-20081223.pdf>.

Steven R. Meier Presents Study Results at Defense AT&L Speaking Event

Judith M. Greig

Steven R. Meier, group deputy director in the Advanced Systems and Technology Directorate, National Reconnaissance Office, was the second speaker in the Defense AT&L

"Meet the Author" lunchtime series. Meier's presentation, delivered on Jan. 27 at the DAU main campus, Fort Belvoir, Va., was on "Best Project Management and Systems Engineering Practices for Large-Scale Federal Acquisition Programs."

Meier presented the results and subsequent analysis of a study of several government defense and intelligence agency large-scale weapons acquisition programs. The study was undertaken to determine why large federal acquisition programs continue to suffer cost and schedule overruns to the average tune of $295 billion in cost growth and 21 months' schedule delay.

Information for the study was gathered from industry, the federal government, national laboratories, think tanks, and existing documents and studies. Some input was received in written form, and some was the result of face-to-face interviews with industry and federal government executives. Meier said that the data both confirmed other studies' findings and provided new information on the common causes of cost and schedule growth on large programs in the defense and intelligence communities.



Steven R. Meier discusses the cost and schedule problems plaguing large-scale defense acquisition programs as revealed by a recent study—problems that can, he explains, be mitigated by good practices in the preacquisition phase.
Photo by Judith Greig

The study revealed a number of factors contributing to agencies' current acquisition environment: overzealous advocacy; immature technology; lack of strategic corporate roadmaps; requirements instability; ineffective acquisition strategy and contractual practices; unrealistic program baselines; inadequate systems engineering; and workforce issues—specifically, a lack of experience and high turnover resulting from assignment rotations.

Meier explained each of the eight factors, outlining the reasons behind each and the impact. He shared comments from the study participants, illustrated points from his own experience, and recommended practices to minimize or eradicate impact on the program.

Most unsuccessful programs, Meier stressed, fail at the beginning, which underscores the need to establish a proper baseline in the preacquisition phase to increase the likelihood of a successful program outcome. To that end, he presented a 13-item preacquisition checklist to help program managers set a strong program basis early in the acquisition life cycle.

Meier encouraged questions throughout his presentation, and the audience of DAU professors, staff, and students engaged in lively discussion with him, several offering their own program experience.

Meier is a widely published author, and his *Defense AT&L* article "Building and Managing an Effective Project Team" appeared in the September-October 2008 issue. A detailed account of the study is available in his article "Best Project Management and Systems Engineering Practices in the Preacquisition Phase for Federal Intelligence and Defense Agencies," *Project Management Journal*, March 2008.

Greig, the former managing editor and executive editor of Defense AT&L, *is a contributing editor to the magazine.*

DAU Hosts Program Attorney's Course at Fort Belvoir

William Henabray • Michael P. Lacroix • Michael C. McGhee • Rexford T. Bragaw III

The program attorney can be one of the least visible members of the program team, especially if things are going well. There are often other occasions, however, when the program attorney can become one of the most important and highly visible members of the program team, especially when programs are forced to navigate the many complex statutory

and regulatory requirements that apply to today's major weapon system acquisitions.

Just when and where do these statutes/regulations impact programs? The short answer is throughout the life cycle of almost any major program and, frequently, at very critical decision points, such as source selections, contract awards, debriefings, high-profile bid protests, major milestone decisions, and other time-critical programmatic events.

To help provide Navy program attorneys with the fast-changing, highly specialized DoD 5000-series training that they need to support their clients, Naval Air Systems Command's Office of General Counsel worked in close coordination with senior Navy General Counsel leadership to help initiate and facilitate the development of a new DAU course designed specifically for DoD program attorneys.

Faculty from the Defense Acquisition University Mid-Atlantic Region (near Patuxent River Naval Air Station, Md.) and DAU's Midwest Region (near Wright-Patterson Air Force Base, Ohio) co-developed the course in 2005. The initial two-week pilot course was offered in July 2005 to 17 attorneys from across the Services at DAU Mid-Atlantic. Based upon attendee comments and follow-on feedback from the first pilot class, the course content was subsequently modified and compressed into a more compact one-week format.

In July 2006, 24 program attorneys from across the Services convened at DAU Mid-Atlantic to attend and pilot the new one-week course. Attendee critiques overwhelmingly validated that the content and length of the revised one-week syllabus met the ambitious learning objectives that both the senior Navy General Counsel leadership and DAU had established.

After a thorough DAU and Navy General Counsel leadership review of the second pilot attendee and instructor critiques, the course became a listed class under the Targeted Training section of the 2007 DAU Catalog as the "Program Attorney's Acquisition Overview Course." The five-day course provides program attorneys with a comprehensive analysis of the three major acquisition systems that their program manager clients must navigate to execute a successful program (i.e., the requirements process, acquisition management, and the budgeting system).

In August of 2008, the DAU main campus at Fort Belvoir, Va., hosted the third offering of the Program Attorney's Course to a capacity class of 36 program attorneys from across the Navy and Marine Corps. The course had a substantial wait list, and every seat was filled.

In addition to the course's comprehensive analysis of the three major acquisition systems, Navy Assistant General Counsel for Research, Development, and Acquisition Susan Raps hosted a special "General Counsel Day" during the August 2008 course that covered timely topical legal issues. DoD Deputy General Counsel for Acquisition and Logistics Douglas Larsen spoke on topical program legal issues and the many challenges that he and his staff attorneys were facing within the Office of the Secretary of Defense. He also emphasized the critical importance of ensuring the statutory compliance and integrity of DoD programs, and what DoD program attorneys could do to help facilitate that process.

Special presentations from a program executive officer, program managers, and financial management experts were also featured as part of the five-day course.

The course is set up based on DAU's proven student-centric approach, and it allows the participants to go through the process of actually formulating an acquisition strategy and gaining an appreciation for the diverse complexities involved in executing a major program. As such, the workshop interactive format also serves as a melting pot of multi-Service ideas and perspectives—the feedback and interest in the course has been phenomenal.

For further information on the workshop, contact the DAU Mid-Atlantic Region at 240-895-7344.

Henabray works for the Naval Air Systems Command Office of Counsel; Lacroix and McGhee are DAU professors of acquisition management; and Bragaw is a DAU professor of contract management.

AT&L Rapid-Deployment Training Now Available for DoDI 5000.02

The official AT&L Rapid-Deployment Training is now available at the Defense Acquisition University Web site < http://www.dau.mil/performance_support/RDT.asp.> This site has the latest updated training based on the published DoDI 5000.02.

DAU and NDIA to Sponsor Defense Systems Acquisition Management Course Offering for Industry Managers

Defense Acquisition University and the National Defense Industrial Association will sponsor an offering of the De-

fense Systems Acquisition Management course for interested industry managers June 8-12, 2009, at the Antlers Hilton Colorado Springs in Colorado Springs, Colo. DSAM presents the same acquisition policy information provided to DoD students who attend the DAU courses for acquisition certification training. It is designed to meet the needs of defense industry acquisition managers in today's dynamic environment, providing the latest information related to:

- Defense acquisition policy for weapons and information technology systems, including discussion of the DoD 5000 series (directive and instruction), and the Defense Acquisition Guidebook
- Defense acquisition reform and initiatives
- Defense acquisition procedures and processes
- The Planning, Programming, Budgeting, and Execution process, and the congressional budget process
- The relationship between capability needs determination, resource allocation, science and technology activities, and acquisition programs.

All course materials will be provided to students on CD-ROM. It is highly recommended that students bring a laptop computer to the class. If you do not have access to a laptop, please contact the respective meeting planner as soon as possible. There will be a limited number of laptops available for use through NDIA, so please call early.

For further information see "Courses Offered" under "Meetings and Events" at <www.ndia.org>. Industry students contact Michelle Hariston at mhariston@ndia.org or 703-247-9478. A limited number of experienced government students may be selected to attend each offering. Prospective government students must first contact Karen Byrd at 703-805-3728 or e-mail karen.byrd@dau.mil prior to registering with NDIA.

TelePresence—DAU's Latest Training Mechanism

The Defense Acquisition University continues to be a leader in leveraging technology to better train and prepare the warfighter. TelePresence, DAU's latest training mechanism, moves beyond existing video teleconferencing technology to create the experience of being "across the table" for remote participants. This innovative technology allows individual professors to present in-person training simultaneously to students at multiple locations in a highly personal and effective manner. One key benefit of TelePresence is the significant cost saving achieved while maintaining a high-quality learning experience for each student.

PMT 401 Program Manager's Course Comes to DAU Midwest Region

Carl Hayden

The DAU Midwest Region in Kettering, Ohio, will begin teaching the PMT 401 Program Manager's Course within the Midwest Region in August 2009. This is the first time a region has been granted permission to teach the PMT 401 Program Manager's Course geographically separate from the Defense Systems Management College–School of Program Managers at Fort Belvoir, Va. After several months of discussions and meetings on the subject, a Memorandum of Understanding was developed and agreed upon by the DSMC-SPM and Midwest Region deans, and the president of DAU.

The plan is to conduct two classes a year and support the Senior Service College Fellowship program in the Midwest Region. The PMT 401 Program Manager's Course is designed to improve DoD acquisition outcomes by strengthening the critical thinking and decision-making skills of potential leaders of major defense acquisition programs and program support. The target audience is Level III program management career field members who have demonstrated the potential to become major program or program management and high-potential Level III acquisition processionals in other career fields, such as contracting, logistics, and financial management.

The Midwest Region has reorganized to accommodate this venture. Effective Jan. 7, 2009, the region's program management department became the acquisition management department led by Professor Sylvester Hubbard. A new program management department will be established, led by the Department Chair Professor Robert "Bob" Steele. He will also act as the regional representative for the PMT 401 Program Manager's Course. The program management department will deliver the Midwest PMT 401 and support other executive-level training.

Any and all inquiries pertaining to the program management department and/or PMT 401 for the Midwest Region should be directed to Department Chair Professor Robert Steele, robert.steele@dau.mil, 937-781-1055.

Hayden is associate dean for academic affairs, DAU Midwest Region.

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Surfing the Net



Acquisition Central
http://acquisition.gov
Shared systems and tools to support the federal acquisition community and business partners.

Acquisition Community Connection (ACC)
http://acc.dau.mil
Policies, procedures, tools, references, publications, Web links, and lessons learned for risk management, contracting, system engineering, TOC.

Aging Systems Sustainment and Enabling Technologies (ASSET)
http://asset.okstate.edu/asset/index.htm
Government-academic-industry partnership. ASSET program-developed technologies and processes expand the DoD supply base, reduce time and cost of parts procurement, enhance military readiness.

Air Force (Acquisition)
www.safaq.hq.af.mil
Policy; career development and training opportunities; reducing TOC; library; links.

Air Force Institute of Technology
www.afit.edu
Graduate degree programs and certificates in engineering and management; Civilian Institution; Center for Systems Engineering; Centers of Excellence; distance learning.

Air Force Materiel Command (AFMC) Contracting Laboratory's FAR Site
http://farsite.hill.af.mil
FAR search tool; *Commerce Business Daily* announcements (CBDNet); *Federal Register*; electronic forms library.

Army Acquisition Support Center
http://asc.army.mil
News; policy; *Army AL&T* Magazine; programs; career information; events; training opportunities.

Army Training Requirements and Resources System
https://www.atrrs.army.mil
Army system of record for managing training requirements.

Assistant Secretary of the Army (Acquisition, Logistics & Technology)
https://webportal.saalt.army.mil
ACAT Listing; ASA(ALT) Bulletin; digital documents library; links to other Army acquisition sites.

Association for the Advancement of Cost Engineering International (AACE)
www.aacei.org
Planning and management of cost and schedules; online technical library; bookstore; technical development; distance learning.

Association of Old Crows (AOC)
www.crows.org
News; conventions, courses; *Journal of Electronic Defense*.

Association of Procurement Technical Assistance Centers (APTAC)
www.aptac-us.org
PTACs nationwide assist businesses with government contracting issues.

AT&L Knowledge Sharing System
http://akss.dau.mil
Automated acquisition reference tool covering mandatory and discretionary practices.

Best Practices Clearinghouse
https://bpch.dau.mil
The authoritative source for acquisition best practices in DoD and industry. Connects communities of practice, centers of excellence, academic and industry sources, and practitioners.

Central Contractor Registry
http://www.ccr.gov/
Registration for businesses wishing to do business with the federal government under a FAR-based contract.

Committee for Purchase from People Who are Blind or Severely Disabled
www.abilityone.gov
Information and guidance to federal customers on the requirements of the Javits-Wagner-O'Day (JWOD) Act.

Defense Acquisition University (DAU) and Defense Systems Management College (DSMO)
www.dau.mil
DAU Course Catalog; *Defense AT&L* magazine and *Defense Acquisition Review Journal*; DAU/DSMC course schedules; educational resources.

DAU Alumni Association
www.dauaa.org
Acquisition tools and resources; links; career opportunities; member forums.

DAU Distance Learning Courses
www.dau.mil/registrar/enroll.asp
DAU online courses.

Defense Advanced Research Projects Agency (DARPA)
www.darpa.mil
News releases; current solicitations; *Doing Business with DARPA*.

Defense Business Transformation Agency (BTA)
www.acq.osd.mil/scst/index.htm
Policy; newsletters; Central Contractor Registration (CCR); assistance centers; DoD EC partners.

Defense Information Systems Agency (DISA)
www.disa.mil
Defense Information System Network; Defense Message System; Global Command and Control System.

Defense Modeling and Simulation Office (DMSO)
www.dmso.mil
DoD modeling and simulation master plan; document library; events; services.

Defense Technical Information Center (DTIC)
www.dtic.mil/
DTIC's scientific and technical information network (STINET) is one of DoD's largest available repositories of scientific, research, and engineering information. Hosts over 100 DoD Web sites.

Deputy Under Secretary of Defense for Acquisition, Technology and Logistics (DUSD(AT&L))
www.acq.osd.mil/at
Acquisition and technology organization, goals, initiatives, and upcoming events.

Director, Defense Procurement and Acquisition Policy (DPAP)
www.acq.osd.mil/dpap
Procurement and acquisition policy news and events; reference library; acquisition education and training policy, guidance.

DoD Defense Standardization Program
www.dsp.dla.mil
DoD standardization; points of contact; FAQs; military specifications and standards reform; newsletters; training; nongovernment standards; links.

DoD Enterprise Software Initiative (ESI)
www.esi.mil
Joint project to implement true software enterprise management process within DoD.

DoD Inspector General Publications
www.dodig.osd.mil/pubs/
Audit and evaluation reports; IG testimony; planned and ongoing audit projects of interest to the AT&L community.

DoD Office of Technology Transition
www.acq.osd.mil/ott
Information about and links to OTT's programs.

DoD Systems Engineering
www.acq.osd.mil/se
Policies, guides and information on SE and related topics, including developmental T&E and acquisition program support.

Earned Value Management
www.acq.osd.mil/pm
Implementation of EVM; latest policy changes; standards; international developments.

Electronic Industries Alliance (EIA)
www.eia.org
Government relations department; links to issues councils; market research assistance.

Federal Acquisition Institute (FAI)
www.fai.gov
Virtual campus for learning opportunities; information access and performance support.

Federal Acquisition Jumpstation
http://prod.nais.nasa.gov/pub/fedproc/home.htm
Procurement and acquisition servers by contracting activity; CBDNet; reference library.

Federal Aviation Administration (FAA)
http://fast.faa.gov
Online policy and guidance for all aspects of the acquisition process.

Federal Business Opportunities
www.fedbizopps.gov
Single government point-of-entry for federal government procurement opportunities over $25,000.

Federal R&D Project Summaries
www.osti.gov/fedrnd/about
Portal to information on federal research projects; search databases at different agencies.

Federal Research in Progress (FEDRIP)
http://grc.ntis.gov/fedrip.htm
Information on federally funded projects in the physical sciences, engineering, life sciences.

Fedworld Information
www.fedworld.gov
Central access point for searching, locating, ordering, and acquiring government and business information.

Government Accountability Office (GAO)
http://.gao.gov
GAO reports;policy and guidance; FAQs.

General Services Administration (GSA)
www.gsa.gov
Online shopping for commercial items to support government interests.



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Surfing the Net

Government-Industry Data Exchange-Program (GIDEP)
www.gidep.org
Federally funded co-op of government-industry participants, providing electronic forum to exchange technical information essential to research, design, development, production, and operational phases of the life cycle of systems, facilities, and equipment.

GOV.Research_Center
http://grc.ntis.gov
U.S. Dept. of Commerce, National Technical Information Service, and National Information Services Corporation joint venture, single-point access to government information.

Integrated Dual-Use Commercial Companies (IDCC)
www.idcc.org
Information for technology-rich commercial companies on doing business with the federal government.

International Society of Logistics
www.sole.org
Online desk references that link to logistics problem-solving advice; Certified Professional Logistician certification.

International Test & Evaluation Association (ITEA)
www.itea.org
Professional association to further development and application of T&E policy and techniques to assess effectiveness, reliability, and safety of new and existing systems and products.

Joint Capability Technology Demonstrations (JCTD)
www.acq.osd.mil/jctd
JCTD's accomplishments, articles, speeches, guidelines, and POCs.

U.S. Joint Forces Command
www.jfcom.mil
"Transformation laboratory" that develops and tests future concepts for warfighting.

Joint Fires Integration and Interoperability Team
https://jfiit.eglin.af.mil
USJFCOM lead agency to investigate, assess, and improve integration, interoperability, and operational effectiveness of Joint Fires and Combat Identification across the Joint warfighting spectrum. (Accessible from .gov and .mil domains only.)

Joint Interoperability Test Command (JITC)
http://jitc.fhu.disa.mil
Policies and procedures for interoperability certification; lessons learned; support.

Joint Spectrum Center (JSC)
www.jsc.mil
Operational spectrum management support to the Joint Staff and COCOMs; conducts R&D into spectrum-efficient technologies.

Library of Congress
www.loc.gov
Research services; Copyright Office; FAQs.

MANPRINT (Manpower and Personnel Integration)
www.manprint.army.mil
Points of contact for program managers; relevant regulations; policy letters from the Army Acquisition Executive; briefings on the MANPRINT program.

National Aeronautics and Space Administration (NASA)'s Commercial Technology Office (CTO)
http://technology.grc.nasa.gov
Promotes competitiveness of U.S. industry through commercial use of NASA technologies and expertise.

National Contract Management Association (NCMA)
www.ncmahq.org
Educational products catalog; publications; career center.

National Defense Industrial Association (NDIA)
www.ndia.org
Association news; events; government policy; *National Defense* magazine.

National Geospatial-Intelligence Agency
www.nima.mil
Imagery; maps and geodata; Freedom of Information Act resources; publications.

National Institute of Standards and Technology (NIST)
www.nist.gov
Information about NIST technology, measurements, and standards programs, products, and services.

National Technical Information Service (NTIS)
www.ntis.gov
Online service for purchasing technical reports, computer products, videotapes, audiocassettes.

Naval Sea Systems Command
www.navsea.navy.mil
TOC; documentation and policy; reduction plan; implementation timeline; TOC reporting templates; FAQs.

Navy Acquisition and Business Management
www.abm.rda.hq.navy.mil
Policy documents; training opportunities; guides on risk management, acquisition environmental issues, past performance; news and assistance for the Standardized Procurement System (SPS) community; notices of upcoming events.

Navy Acquisition, Research and Development Information Center
www.onr.navy.mil/sci_tech
News and announcements; publications and regulations; technical reports; doing business with the Navy.

Navy Best Manufacturing Practices Center of Excellence
www.bmpcoe.org
National resource to identify and share best manufacturing and business practices in use throughout industry, government, academia.

Naval Air Systems Command (NAVAIR)
www.navair.navy.mil
Provides advanced warfare technology through the efforts of a seamless, integrated, worldwide network of aviation technology experts.

Office of Force Transformation
www.oft.osd.mil
News on transformation policies, programs, and projects throughout DoD and the Services.

Open Systems Joint Task Force
www.acq.osd.mil/osjtf
Open systems education and training opportunities; studies and assessments; projects, initiatives and plans; library.

Parts Standardization and Management Committee (PSMC)
www.dscc.dla.mil/programs/psmc
Collaborative effort between government and industry for parts management and standardization through commonality of parts and processes.

Performance-based Logistics Toolkit
https://acc.dau.mil/pbltoolkit
Web-based 12-step process model for development, implementation, and management of PBL strategies.

Project Management Institute
www.pmi.org
Program management publications; information resources; professional practices; career certification.

Small Business Administration (SBA)
www.sba.gov
Communications network for small businesses.

DoD Office of Small Business Programs
www.acq.osd.mil/osbp
Program and process information; current solicitations; Help Desk information.

Software Program Managers Network
www.spmn.com
Supports project managers, software practitioners, and government contractors. Contains publications on highly effective software development best practices.

Space and Naval Warfare Systems Command (SPAWAR)
https://e-commerce.spawar.navy.mil
SPAWAR business opportunities; acquisition news; solicitations; small business information.

System of Systems Engineering Center of Excellence (SoSECE)
www.sosece.org
Advances the development, evolution, practice, and application of the system of systems engineering discipline across individual and enterprise-wide systems.

Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L))
www.acq.osd.mil
USD(AT&L) documents; streaming videos; links.

U.S. Coast Guard
www.uscg.mil
News and current events; services; points of contact; FAQs.

U.S. Department of Transportation Maritime Administration
www.marad.dot.gov
Information and guidance on the requirements for shipping cargo on U.S. flag vessels.

Links current at press time. To add a non-commercial defense acquisition/acquisition and logistics-related Web site to this list, or to update your current listing, please fax your request to *Defense AT&L*, 703-805-2917 or e-mail datl(at)dau.mil. Your description may be edited and/or shortened. DAU encourages the reciprocal linking of its home page to other interested agencies. Contact: webmaster(at)dau.mil.

Defense AT&L Writer's Guidelines in Brief

Purpose

Defense AT&L is a bi-monthly magazine published by DAU Press, Defense Acquisition University, for senior military personnel, civilians, defense contractors, and defense industry professionals in program management and the acquisition, technology, and logistics workforce. The magazine provides information on policies, trends, events, and current thinking regarding program management and the acquisition, technology, and logistics workforce.

Submission Procedures

Submit articles by e-mail to datl(at)dau.mil or on disk to: DAU Press, ATTN: Carol Scheina, 9820 Belvoir Rd., Suite 3, Fort Belvoir VA 22060-5565. Submissions must include the author's name, mailing address, office phone number, e-mail address, and fax number.

Receipt of your submission will be acknowledged in five working days. You will be notified of our publication decision in two to three weeks.

Deadlines

Issue	**Author Deadline**
January-February	1 October
March-April	1 December
May-June	1 February
July-August	1 April
September-October	1 June
November-December	1 August

If the magazine fills before the author deadline, submissions are considered for the following issue.

Audience

Defense AT&L readers are mainly acquisition professionals serving in career positions covered by the Defense Acquisition Workforce Improvement Act (DAWIA) or industry equivalent.

Style

Defense AT&L prints feature stories focusing on real people and events. The magazine also seeks articles that reflect your experiences and observations rather than pages of researched information.

The magazine does not print academic papers; fact sheets; technical papers; white papers; or articles with footnotes, endnotes, or references. Manuscripts meeting any of those criteria are more suited to DAU's journal, *Acquisition Review Journal (ARJ)*.

Defense AT&L does not reprint from other publications. Please do not submit manuscripts that have appeared in print elsewhere. *Defense AT&L* does not publish endorsements of products for sale.

Length

Articles should be 1,500 – 2,500 words.

Format

Submissions should be sent via e-mail as a Microsoft® Word attachment.

Graphics

Do not embed photographs or charts in the manuscript. Digital files of photos or graphics should be sent as e-mail attachments or mailed on CDs (see address above). Each figure or chart must be saved as a separate file in the original software format in which it was created.

TIF or JPEG files must have a resolution of 300 pixels per inch; enhanced resolutions are not acceptable; images downloaded from the Web are not of adequate quality for reproduction. Detailed tables and charts are not accepted for publication because they will be illegible when reduced to fit at most one-third of a magazine page.

Non-Department of Defense photos and graphics are printed only with written permission from the source. It is the author's responsibility to obtain and submit permission with the article.

Author Information

Contact and biographical information will be included with each article selected for publication in *Defense AT&L*. Please include the following information with your submission: name, position title, department, institution, address, phone number, and e-mail address. Also, please supply a short biographical statement, not to exceed 25 words, in a separate file. We do not print author bio photographs.

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Alternatively, you may submit a written release from the major command (normally the public affairs office) indicating the author is releasing the article to *Defense AT&L* for publication without restriction.

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